Better Homes and Gardens®

WOOD®

THE WORLD'S LEADING WOODWORKING MAGAZINE

APRIL 1993 • ISSUE NO. 60
Please display until April 12

Elegant DINING CHAIRS Page 72

BUYER'S GUIDE

FINISHING SANDERS LOW-PRESSURE SPRAYERS

WOOD VISITS TWO READERS' SHOPS

HOW TO MAKE SCROLLSAWED RELIEF SIGNS

NEAT PROJECTS!

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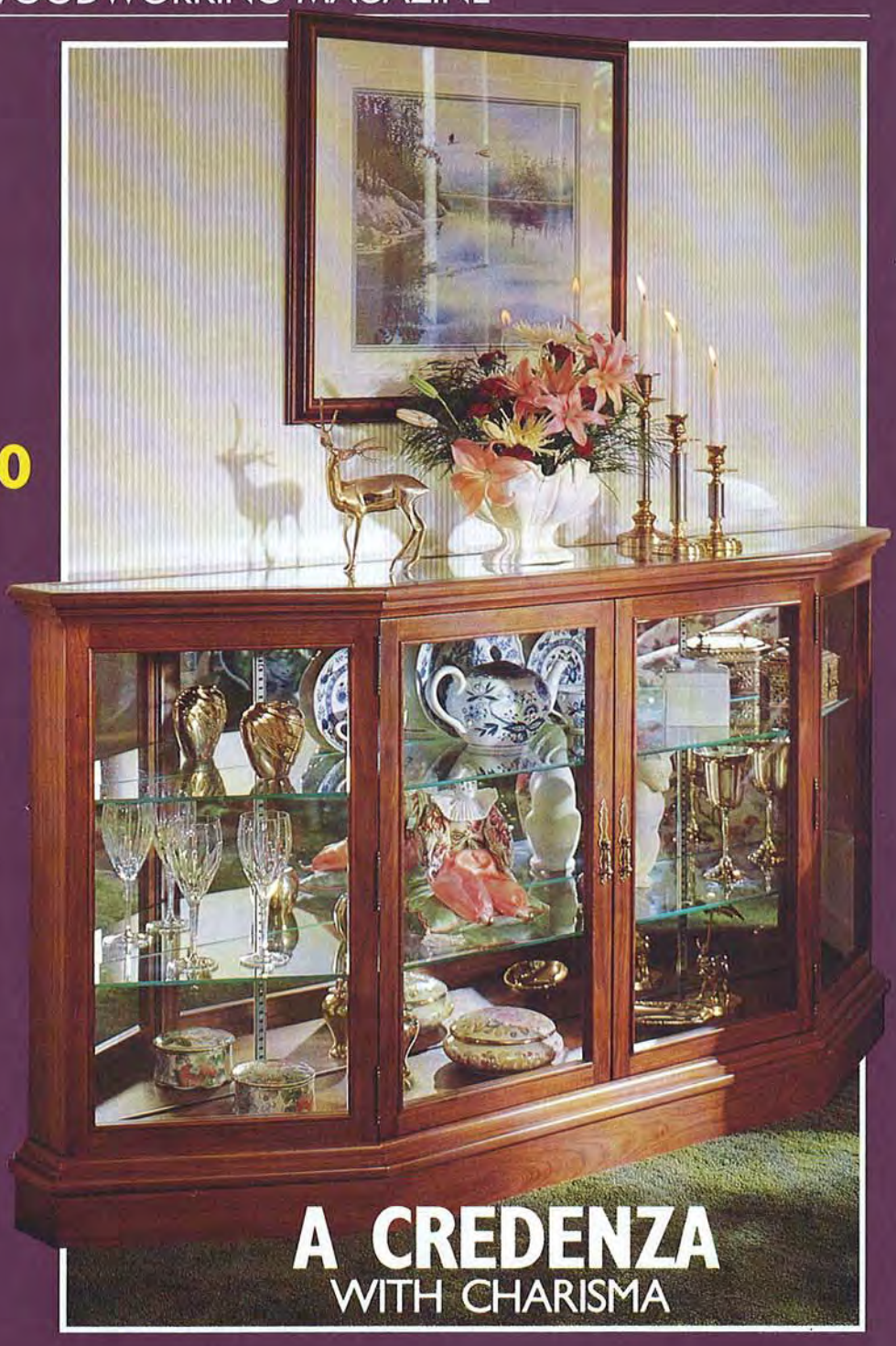
- Fridge magnets
- Carved bowl
- Door plaque



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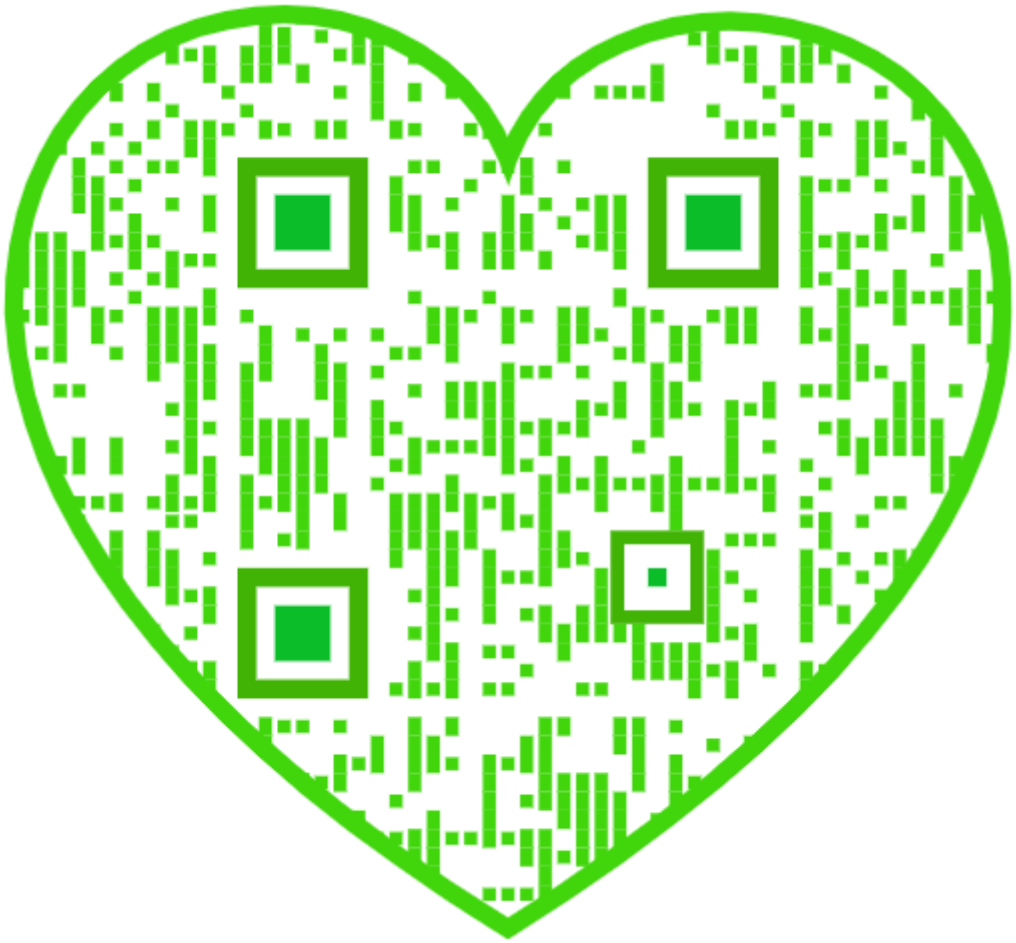

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THE EDITOR'S ANGLE

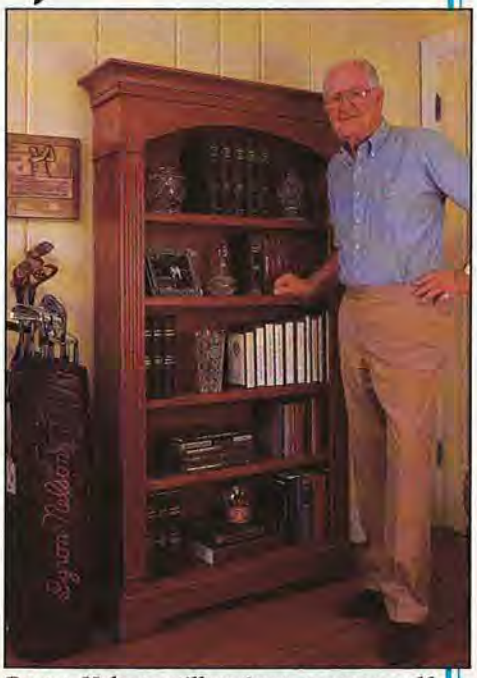
NICE SHOT, BYRON!

GOLF LEGEND TAKES A SWING AT OUR BOOKCASE PROJECT

What does Byron Nelson do when he's not playing golf or working on his soon-to-be-published autobiography, *How I Played the Game*? Woodworking, of course. Byron, who has been enjoying this hobby for over 15 years, recently shared with us this photo of his latest project, a downsized, solid-cherry version of our bookcase project from issue 50. In the letter that accompanied the photo, he said, "I was pleased to find I could make all the moldings and trim myself, thanks to your good plans. And I have to say I'm quite proud of the finished piece."

Congratulations on doing such a fine job on your bookcase, Byron. It looks great! And thanks for your kind words. Here's hoping that we continue to serve your woodworking needs and provide you with more great plans.

By the way, for those of you not familiar with Byron's exploits as a golf professional, here's something



Byron Nelson still swings a mean golf club, but woodworks during lots of his time, too.

I found fascinating. In 1945 this golf legend won 11 tournaments in a row, and out of the 30 tournaments he entered that year, Byron finished 1st or 2nd in 25 of them. WOW! When I asked Byron about this accomplishment, he said that today there are a hundred or more better golfers. You know, somehow I doubt that.

Photograph: Jenifer Jordan

Two special thank-you's

My thanks to all of the many readers, like Byron, who have taken the time to send in a photo or two of their projects. The staff and I really get inspired when we see all of the terrific projects that you make for your friends and family. Keep up the great work, and don't be shy about sharing your woodworking successes.

I'd also like to tip my hat to those who sent in toys for our Build-A-Toy® contest again this year. We appreciate your involvement. You've given the needy kids around the country a Christmas to remember.

Larry Clayton

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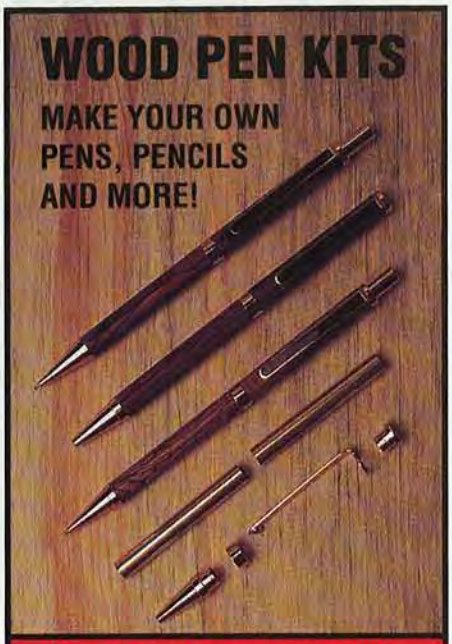

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This issue's cover wood grain: sen *Cover photograph: Wm. Hopkins*

APRIL 1993 ISSUE NO. 60

WOOD PROFILE

White oak: the weatherproof stock of Old Ironsides, barrels, and mission furniture 33

This mighty tree, reaching heights of 150 feet and diameters of four feet, serves up attractive wood for cabinetmaking and outdoor projects.

CRAFTSMAN CLOSE-UP

Darkhouse decoys 35

Join us as we visit expert Ray Zelinski from New York and delve into the hand-carving, painting, and history of fish decoys—a most colorful form of folk art.

SHOP-TESTED TECHNIQUES

Sign-making made easy 40

Learn how to make impressive relief signs using your bandsaw and scrollsaw, and our full-sized patterns, alphabet, and resawing jig.

TURNING

Lamination sensation 46

If you haven't made a stack-laminated bowl before, grab your clamps and check out this handsome design. You'll be glad you did.

CARVING

Bird-in-the-hand ale bowl 50

Not all bowls are turned. In fact, you can create this hen-motif vessel, an old world replica, with gouges, a benchknife, and a V-tool. You'll find the end result well worth the effort.

TOOL BUYMANSHIP

Finishing sanders 52

Get smooth, finish-ready results on your projects with one of the 29 models tested here. Sander choices include ¼-, ⅓-, and ½-sheet sizes.

A credenza with charisma 58
Looking for that perfect showcase for your favorite collectibles? It just arrived. Our mirrored walnut unit affords multiple views of precious items displayed within or sitting on top.

Home workshops that work 65
Check out the two problem-solving reader shops inside for ideas that may help improve the efficiency of your hobby area.

THE CRAFT SHOP
Wildfowl fridge magnets 68
Call 'em goofy, call 'em hilarious. Either way, you'll have a ball scrollsawing these comical critters.

V.I.P. door plaque 70
Give kids' rooms a personal touch with a creative sign that marks their space.

Elegant oak dining chair 72
Build a set of these beautiful mission-style chairs to go with the matching dining table from the February 1993 issue of *WOOD*® magazine. Then, invite guests over for a meal and a little show and tell.

High-volume, low-pressure sprayers 79
Read about a cleaner, more efficient way to apply finish to your woodworking projects using today's new breed of sprayers.

SHORT-SUBJECT FEATURES

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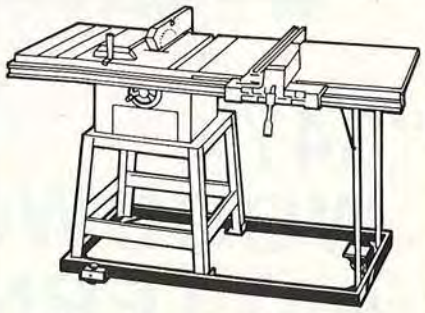

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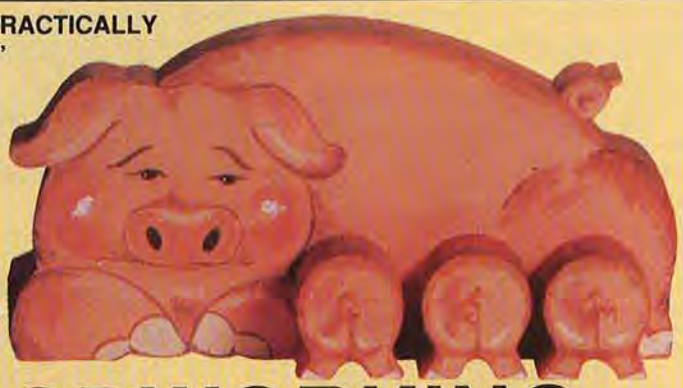

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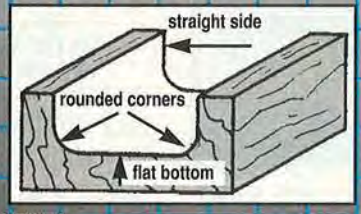

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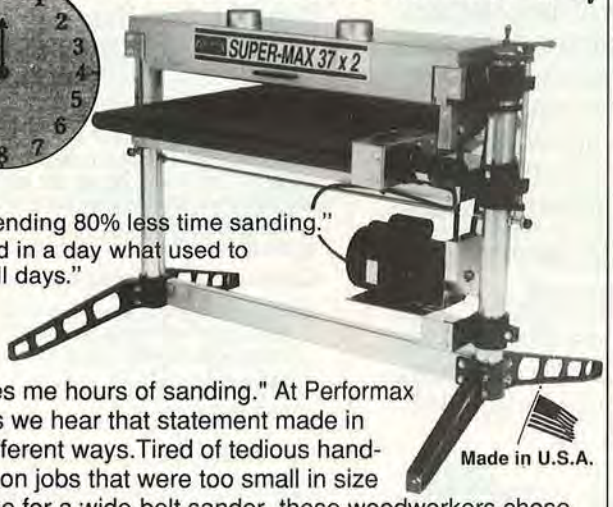

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TALKING BACK

We welcome comments, criticisms, suggestions, and even compliments. Send your correspondence to: Talking Back, Better Homes and Gardens *WOOD*® magazine, 1912 Grand Ave., Des Moines, IA 50309-3379.

"V" is for vase

I thought the bud vases in the December 1991 issue would make good woodworking projects for the kindergarten class that I am involved with. Each week of the school year, the class learns about a new letter. We made 55 vases during "V" week.

I cut slightly oversized walnut blocks so that they could be clamped to the workbench. Then I drilled the test-tube holes, bandsawed the sides, and took the new vases to class. There, I used bar clamps and C-clamps to hold them steady so that the children could sand them. A piece of paper with the child's name was attached to each vase. The next day, the children put on one coat of Watco Walnut Stain. Later that day, the kids inserted the tubes and took their projects home. It was a huge success! Thanks for the great idea.

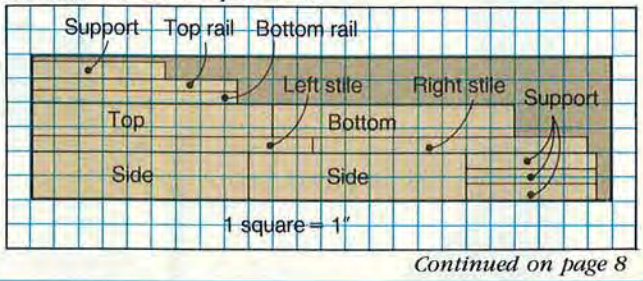
—Jan Roger Foster, Estacada, Ore.

Save more on cutting diagrams

I'm a structural engineer and amateur woodworker. In response to "Waste Paper Not Wood," in your October 1992 issue, I have an additional suggestion. When laying out material, several approaches should be used to minimize the amount of small pieces of wood left. I experiment until I find the optimum arrangement. You can see my improvement on your original diagram.

—R.A. Coates, Ontario, Canada.

R.A., we do work to get the most out of the lumber materials we use for projects. As indicated in our cutting diagrams accompanying major projects, we follow your advice while keeping waste down to around 10 to 15 percent.



Continued on page 8

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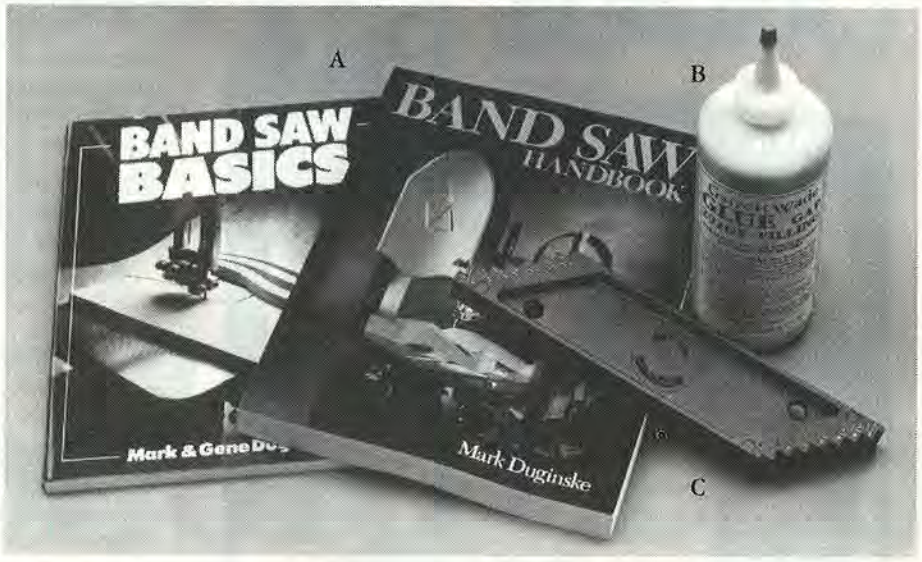
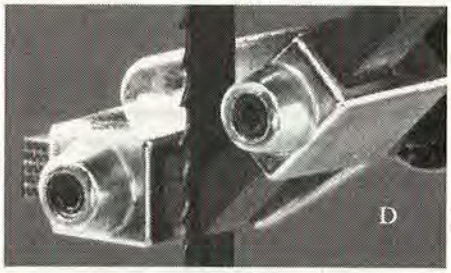


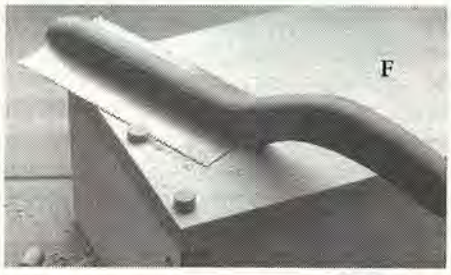
A/ Two Band Saw Books *by Mark Duginske*
Learn what makes your bandsaw tick. Tune-up and maintenance, blade selection, tracking and tensioning, plus cutting methods for woods and other materials. Unlock your saw's potential.

02L09.03	Band Saw Basics	$ 9.95
16L04.02	Band Saw Handbook	$16.95

B/ Our Unique 202GF Glue Fills Gaps
It has a very high solids content, so small gaps in joinery are actually filled – with strength. The "squeeze-out" beads right up and chips off when dry – no soaking in to ruin finishes. Woodworkers who use this special glue swear by its superiority. Dries to a light tan. Water clean-up.

62J01.01	1 Pt. 202GF Glue	$ 7.25
62J01.03	1 Qt. 202GF Glue	$13.10





C/ The Saw Setting Gauge That Can Be Read From Any Position
This 9" long aluminum gauge is ¾" thick – wide enough to ensure that the blade is always gauged at the top of its arc. It has accurately machined ¼" graduations on one end, and ⅛" graduations on the other. It will indicate any blade height from ⅛" to 2". Markings read vertically on one face, and horizontally on the other. Extremely useful for table saw set-up, and handy for routers too.

71K26.02	Saw Setting Gauge	$17.95

D/ Special Bandsaw Cool Blocks® Prolong Blade Life & Increase Accuracy
Made of a special graphite-impregnated phenolic laminate, the set of 4 replaces your saw's upper and lower side blade guides. Cool Blocks® run cooler and are more slippery than conventional steel guides, and give you better control since they can be set actually touching the blade.

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33K09.02	B Sears 12" (⅜" square)	$11.95
33K09.04	D Shopsmith	$12.95
33K09.05	E Old Sears (¼" round)	$11.95
33K09.06	F Jet 14" (& Delta copies)	$11.95
33K09.07	G Old Sears (5/16" round)	$11.95
33K09.20	K New Tilt Head Sears	$16.95

E/ 1/16" Super Narrow Scroll Cutting Bandsaw Blades Increase Your Saw's Versatility
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33K11.04	⅛" 14 tpi Scroll	$14.95
33K11.02	¼" 4 tpi Cabinet	$11.95
33K11.03	½" 3 tpi Cabinet	$12.95

80" Blades (Sears 12")

33K12.01	1/16" 24 tpi Scroll	$14.95
33K12.04	⅛" 14 tpi Scroll	$13.75
33K12.02	¼" 4 tpi Cabinet	$10.95
33K12.03	½" 3 tpi Cabinet	$11.95

72" Blades (Shopsmith)

33K13.01	1/16" 24 tpi Scroll	$13.40
33K13.04	⅛" 14 tpi Scroll	$12.50
33K13.02	¼" 4 tpi Cabinet	$10.25
33K13.03	½" 3 tpi Cabinet	$10.95

F/ French Flush Cutting Saw Makes Trimming Dowels & Plugs Easy
This double sided 6½" long blade has 11 tpi on one side and 20 tpi on the other, giving it more versatility than other flush cutting saws. It's also much less expensive. The teeth have no set on the bottom side, and very slight set on the top side to help clearance in the cut. The blade is bent slightly upward from the frame so the cutting action will not scratch the adjacent surface.

70I02.01	French Flush Saw	$15.95

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TALKING BACK

Continued from page 6

Are tool dealers a dying breed?

The article on the Ryobi BT 3000 tablesaw in your October 1992 issue was factual and complete. As a "full-line" Ryobi dealer, I have demonstrated this machine many times and can attest to your accuracy. However, you state the machine can be purchased for under $600 at Ryobi dealers.

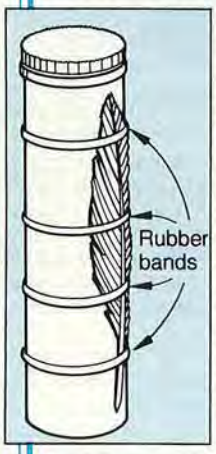
While this tool may be available through mass merchandisers and mail-order houses at this price, it probably is not available through full-service dealers for under $600. And there are some good reasons for that. Basically, dealers work on a modest markup for which we must maintain a showroom. Here, a customer can actually see and touch the tool. Plus, we service them. We don't just send them a box [containing a tool].

Most of us dealers have a hard time keeping our doors open in this tight economy. We find it very tough to compete with this type of competition. I hope I'm wrong, but dealers like myself may soon become a thing of the past.

—Fred Mayer, Pittstown, N.J.

New twist on our wood-duck feather

I enjoyed the article, "Carve a Colorful Feather Pin" in your October 1992 issue. Feather carving is one of my pastimes. However, I use a slightly different method of shaping the feather, which gives almost the same effect as yours. And, my method eliminates grinding and dust. I use ¼"-thick basswood which you can find in most hobby shops. Then, I simply cut out the desired shape and burn in the details of the feather with a woodburning pen. Next, I soak the feather for 15—20 minutes in water while finding a cylindrical object the proper size, such as an olive bottle. After soaking, I use a couple of rubber bands to hold the feather against the cylinder until the wood dries. I paint [the feather] using a method similar to yours.



—Bob Gootee, Stratham, N.H.

Readers "quack" about duck decoy

The well-defined, upright forehead of the unfinished duck decoy being held by Mr. Chesser on *page 28* of your October 1992 issue is anything but a canvasback as you state. Any Roman-schnozz canvasback would sound a quacking "NOT" as he flew by this decoy. A widgeon, however, would probably come in for a closer look.

—Tip Dyrenforth, Dunwoody, Ga.

We were sitting ducks on that one, Tip. Thanks for setting the record straight.

From 60 years of experience, WOOD® is number one

I started woodworking in 1932 at age ten and have subscribed to many different woodworking magazines (over 25 during that time). But after subscribing to your very first issue, I knew I had hit a gold mine. Yours is simply the best I have ever subscribed to. Keep up the good work.

—Al Heath, Skandia, Mich.

Quassia source found at last

In your 1992 November issue a reader asked about a source for quassia wood chips. We are a New York-based importer of Caribbean agricultural products and have been importing quassia wood chips for several years. We would be glad to supply any of your interested readers. Just write to me at:

D. Steengrafe and Co., Inc.
26 Broadway
New York, NY 10004

—Margot Nordenholt, New York, N.Y.

Thanks, Margot. We appreciate your telling us where readers can locate and purchase chips from the amazing quassia tree.

"Swamp cooler" to the rescue

I found your article on the air-filtration cabinet in your October 1992 issue most informative. About five years ago, I made such a cabinet from an evaporative cooler, known as a swamp cooler in these parts. I gave it a major overhaul, replacing the fan motor with the largest "squirrel cage" fan/motor I could possibly squeeze into the shell. I removed all of the water induction equipment and replaced the filters with a dust-type filter. Then, I mounted the cabinet on a dolly. Now I can move it to wherever I happen to be working. And I only have about $65 invested. It works great!

—Chuck Mayo, Chandler, Ariz.

Router table gets "souped" up

I really like your router table with the Ryobi RE600 in issue 33. But, I wanted a router table that would do more operations. So, I took your version, extended the table dimensions, and added a Shopsmith overarm pin-routing stand. Then, on one end of the table, I built a slot-mortising attachment using a plunge router. I appreciate the good articles that can spark ideas like this one.

—Ray Dietrick, Evart, Mich.

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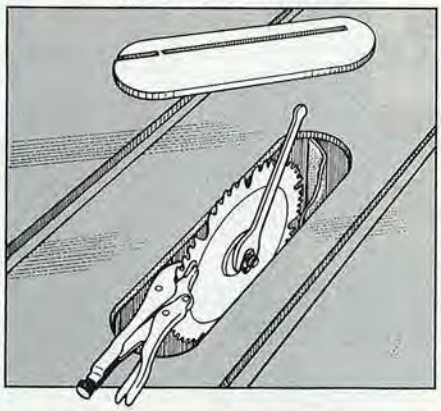
Des Moines, IA 50309-3379

Locking pliers hold saw blade in a pinch

Wedging a tablesaw blade with scrapwood when loosening (or tightening) the arbor nut doesn't always hold the blade immobile.

TIP: Clamp your locking pliers onto the blade near the rim, positioning the jaws to clear the teeth. Brace the pliers against the table. Now when you apply the wrench to the arbor nut, you won't lose your hold on the blade.

–Jim Prelesnik, Renton, Wash.



Convert pipe couplers into inexpensive blast gates

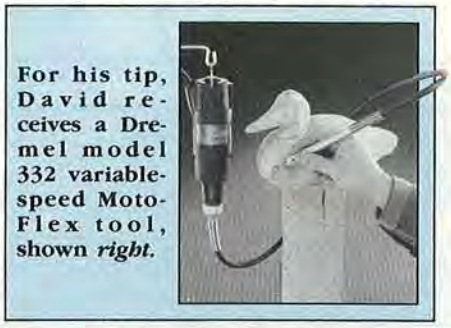
A built-in dust-collection system requires blast gates. They can become a major expense if you have many outlets in your system, however.

TIP: If you use PVC pipe for your system, make your own blast gates quickly and economically with a PVC coupling and a piece of sheet metal. Start by cutting a piece of thin sheet metal (you also could use aluminum, plexiglass, or other thin, rigid material) as wide as the coupler's inside diameter and as long as the outside diameter plus 2". This will be your gate.

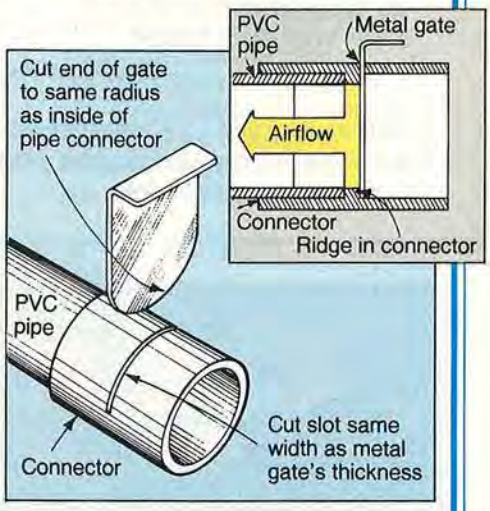
Stand the coupler on the gate, and trace the inside curve on one end of the gate. Cut the curved end, and file or sand smooth. Bend a 90° angle on the square end, leaving enough lip for a handle.

Next, bandsaw or hacksaw a kerf halfway through the coupling along one side of the inside center ridge. Your gate needs to fit into the slot fairly snugly, so size the kerf accordingly. Slide the gate into the coupling to complete the blast gate. Install it with the longer end of the coupling on the vacuum side of the system. That way, air flow will press the gate against the ridge inside for best sealing.

–David Weissman, Norwood, N.J.



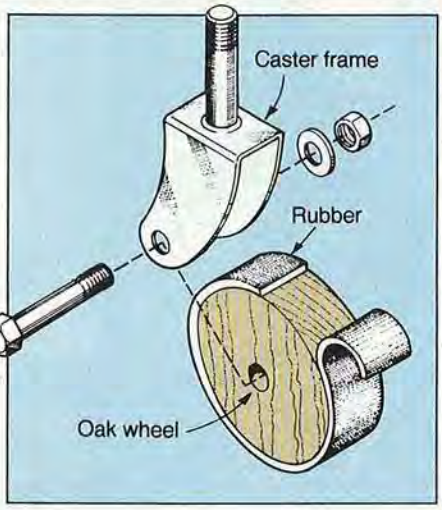
For his tip, David receives a Dremel model 332 variable-speed Moto-Flex tool, shown *right*.



Wooden wheels with tires replace tired-out casters

Hard-plastic caster wheels on some machine bases break up after a while. Replacing the entire caster can be costly if you have several that need attention.

TIP: Don't replace the entire caster, just the wheel. Remove the original wheel by grinding the staked end of the caster axle. Make the new one from scrap hardwood. To cut the wheel, set your hole-cutter radius to that of the original wheel minus the thickness of your tire material. (Strips cut from inner tubes work great.) Glue the tire to the wheel with cyanoacrylate adhesive, fastening the ends with tacks. Use a bolt of appropriate diameter and length as an axle, enlarging the hole-cutter pilot-bit hole to fit.



–Larry McConnell, Medford, Ore.

Continued on page 12

Craftsman's New Radials Industry Leaders Any Way You Cut It.

Dave,
See my notes.
Wow! I'm impressed with the stability of the carriage assembly. Like the new wide track design and double yoke.
CRAFTSMAN
Contractor Series
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CRAFTSMAN
Terrific! Adjustments look easy.
Great! I see you have patent pending on new internal booted motor switch.
New guard is great. Obviously best in the industry.
Great job!
Roger

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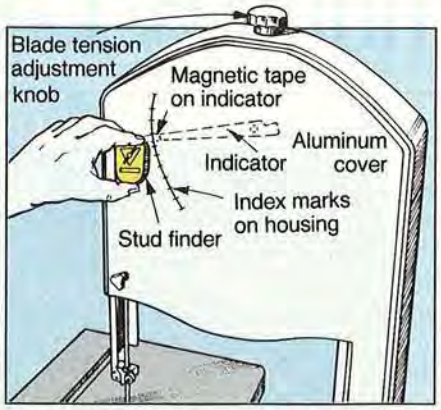
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 10

Undercover magnet reveals tension on bandsaw blade

The blade-tension scale and pointer for your bandsaw are inside the housing, even though the adjusting knob is outside. So, you must open the housing to retension the blade, after loosening it between uses, for instance.



TIP: On a bandsaw with an aluminum wheel housing, eliminate the need to look inside. Just attach magnetic tape to the back of the scale pointer. Place the magnetic side toward the housing, and secure it with tape. Set the tension, using the scale.

Then, move a magnetic stud finder along the outside of the housing until it indicates the location of the magnetic tape. (For accuracy, hold the stud finder so its magnet bar pivots up and down rather than side to side.) Mark that point with paint or an indelible marker. Now, when you're done using the saw, just loosen the blade tension by unscrewing the knob two or three turns. To retension the blade, tighten the adjusting knob the same number of turns and verify the setting with the stud finder.

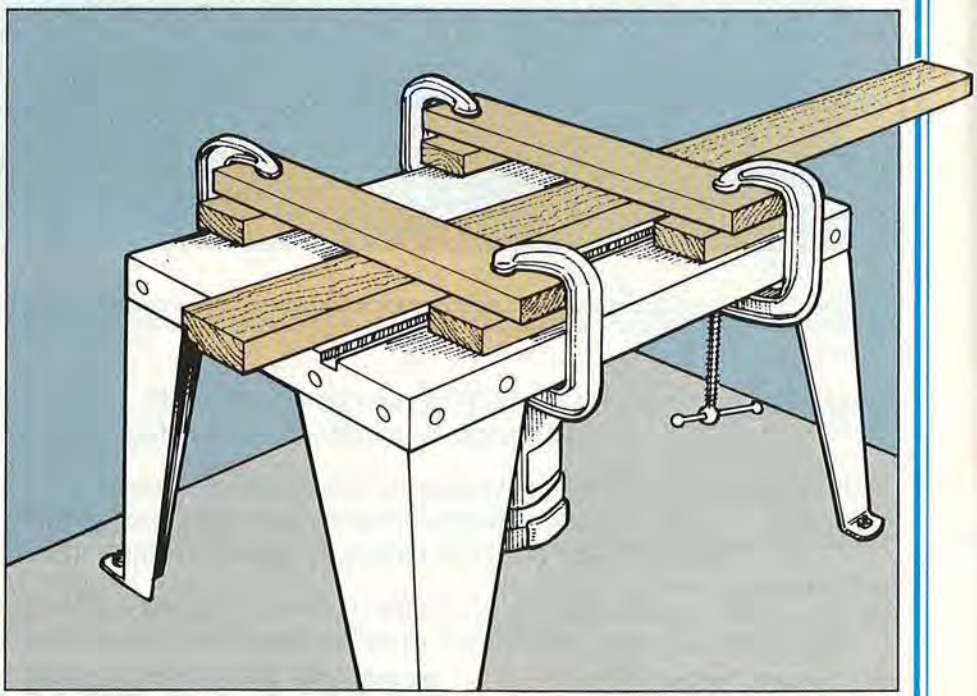
–Earl A. Pyle, Spearfish, S.D.

Simple hold-down gives tip-up the brush-off

Long stock can be hard to handle on a table-mounted router—the overhanging end tends to tip the other end away from the bit.

TIP: Cut two 1×4 crossbars to span the router table front to back. Then, from stock the same thickness as the workpiece, cut four spacers 2–4″ wide, 6″ long. Clamp to the table as shown, placing a 1/32″-thick shim between each crossbar and spacer. Secure the router table so that the weight of the workpiece won't upset it.

–Honest John Adams, Mansfield, Ohio



Continued on page 14

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TIPS FROM YOUR SHOP (AND OURS)

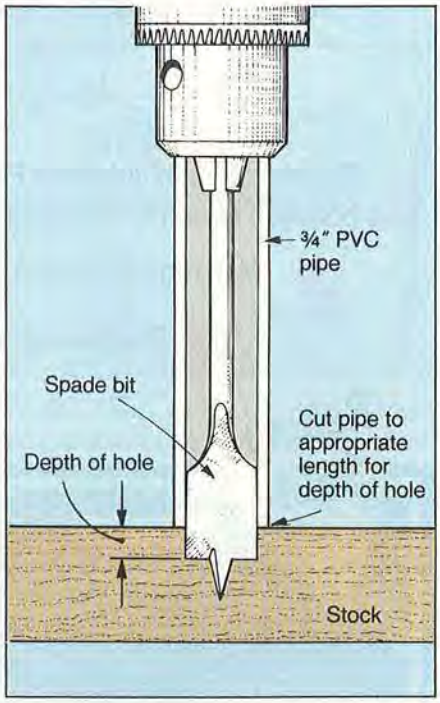
Continued from page 12

Tape may slip up on you, but pipe keeps on marking

You're drilling a series of holes with a spade bit. It's slow going, though, because the masking tape you wrapped around the bit as a depth gauge keeps coming off.

TIP: Scrounge up a piece of PVC pipe to make a depth gauge that won't fail you. Just draw a line on your bit indicating the hole depth, and then cut a piece of appropriately sized plastic pipe to fit between that mark and the face of your drill chuck. Slide the pipe over the bit, and drill away. Friction should hold the pipe in place. If not, saw a slit in the end that fits over the bit and place a hose clamp around the end to clamp the pipe.

—Robert Bourg Jr., Gray, La.



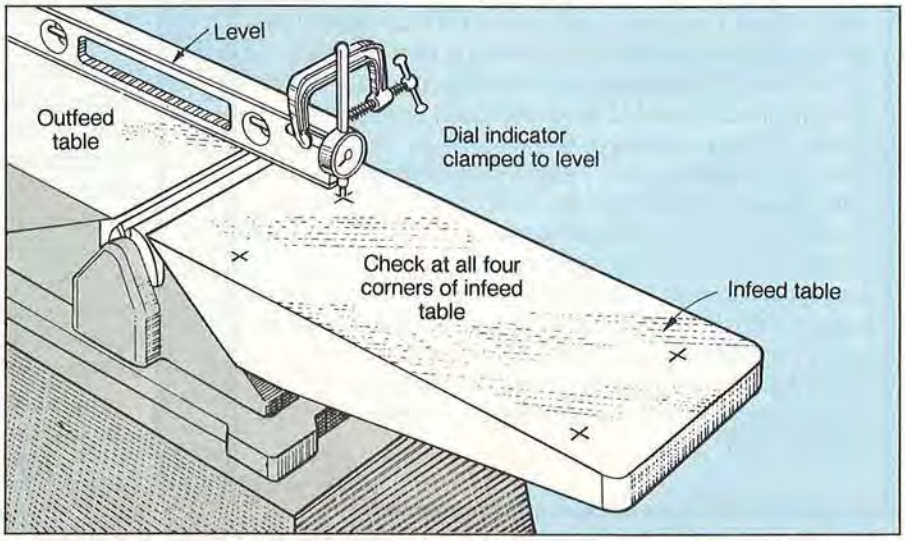
Dial 0 to align jointer tables

Even a slight misalignment between your jointer's infeed and outfeed tables can result in a noticeable error after several passes. You need a way to adjust that infeed table accurately.

TIP: Use a level, a dial indicator, and a clamp to align your jointer's adjustable infeed table with the fixed outfeed table quickly and precisely. Lay the level on the outfeed table along one side. Then, clamp the dial indicator (available from hardware or auto-supply dealers) to the end of the level, setting the indicator to 0 at one corner of the infeed table.

Now, position the indicator probe on another corner of the infeed table by moving the level. Press the level firmly to the outfeed table. Adjust the infeed table to bring the dial reading to 0, if necessary. Similarly adjust the other corners, and recheck.

—John Platania, Loveland, Ohio



Continued on page 16

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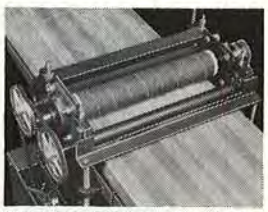

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TIPS FROM YOUR SHOP (AND OURS)

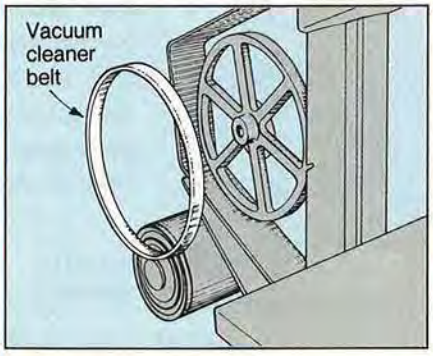
Continued from page 14

Make a clean sweep when seeking tool parts

Repair parts for some imported power tools can be tough to find.

TIP: Don't overlook any possible source for substitute parts. Vacuum cleaner and sewing machine dealers carry a variety of drive belts, for instance. A wide, flat one could replace a damaged tire on a small bandsaw. A sewing-machine drive belt might fit a power tool with a broken belt.

—Patricia Knute, Lake Worth, Fla.

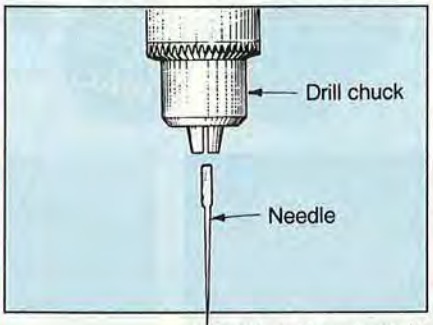


Needle meets need for tiny drill bit

You need to drill a tiny hole. But you don't have a bit smaller than 1/16", and that's still too large.

TIP: Chuck a sewing-machine needle into your drill to make the tiny hole. You'll find the needles in different sizes and styles at fabric stores or sewing-machine dealers. Choose needles with sharp points instead of blunt or ball-end styles. Look for an enlarged shank, too, to give your chuck a better grip on the needle. Drill slowly to avoid burning.

—Don Greenidge, Floral Park, N.Y.



Continued on page 19

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- Table tilts to 45°
- Sealed Ball Bearings

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- 3/4 HP, 1720 RPM
- **FREE** Belts & Disc worth $20.00

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Features:
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#DC3 750 CFM Portable Dust Collector only $209.95

This 1-1/2HP model is lightweight and portable at less than 50 lbs.

- 1-1/2 HP, 110/220V
- 1 outlet @ 4"
- 1 (30 Mic) Bag @ 20 Gal.
- 46 lbs. • 750 CFM
- **FREE** 8' of hose, 1ea. 4" to 3" adaptor & 1 ea. 4" to 2" adaptor. $15 Value

#DC3 ... $209.95 (UPS $10)

#DC1-B 700 CFM Dust Collector only $209.95

This 1HP model is perfect for hookups to almost any single machine.

- 1HP, 110/220V
- 2 outlets @ 4"
- 2 (30 Mic) Bags @ 25 Gal.
- 66 lbs. • 700 CFM
- **FREE** 8' of hose, 1ea. 4" to 3" adaptor & 1 ea. 4" to 2" adaptor. $15 Value

#DC1-B..$209.95 (UPS $20)

#DC2 900 CFM Dust Collector only $299.95

This 1-1/2HP model allows for use in two or more machines. Improved service for long runs of hose.

- 1-1/2HP, 110/220V
- 2 outlets @ 4"
- 2 (30 Mic) Bags @ 30 Gal.
- 130 lbs. • 900 CFM
- **FREE** 50' of hose, 1ea. 4" to 3" adaptor & 2 ea. 4" to 2" adaptor. $40 Value

#DC2 ... $299.95 (UPS $30)

#DC4 1900 CFM Dust Collector

Intro price **only $540.00**

This new 3HP model is suitable for collecting from 3 machines simultaneously. DC4 is perfect for the small to med. sized shop or commercial/industrial applications.

- 3HP, 220V • 3 outlets @ 4"
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Continued from page 16

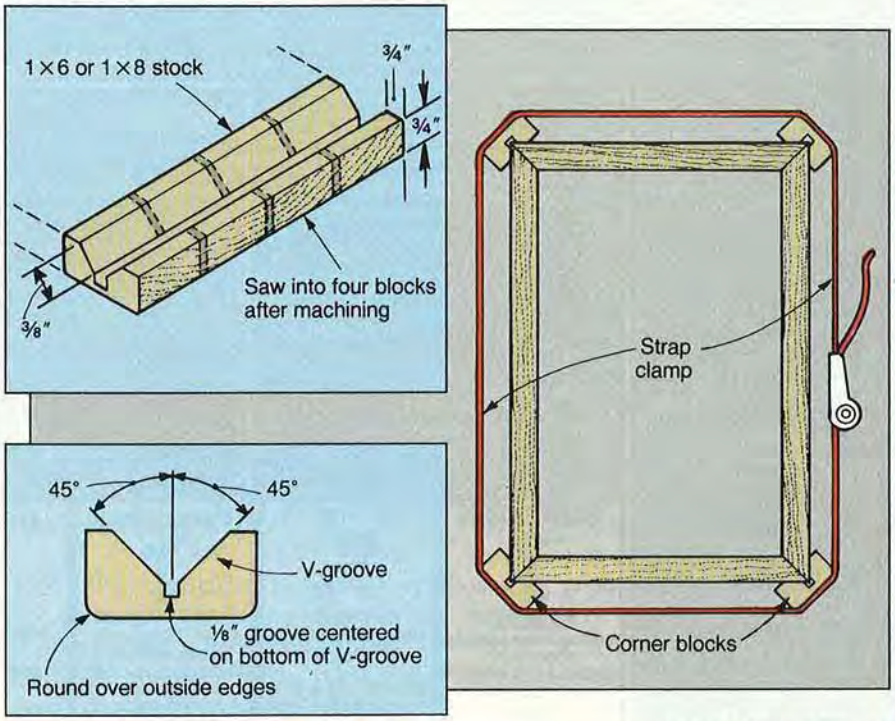
Wooden clamp corners clamp corners better

Metal corner brackets supplied with some strap-type woodworking clamps can hinder rather than help a woodworker. Rounded corners crush the wood, and the sharp edges can mar fine wood.

TIP: Improve the strap clamp with wooden corners. Crosscut a 90° V-groove about ⅜" deep ¾" from one end of a 12"-long hardwood 1×6 or 1×8. Do this by tilting your saw blade to 45° and making a pass from each edge. Cut a ⅛" kerf ⅛" deep in the center of the groove. Cut off the machined end, centering the groove on the piece. Rout a ¼" or ⅜" round-over on the back edges.

Cut four equal corner blocks, and sand. The kerfed V-groove prevents corner damage—and gluing the block to your project.

–Brian Schaible, San Diego, Calif.



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1608U	UNDERSCRIBE TRIMMER	117
1609K	INSTALLERS KIT WITH 3 BASES	174
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1613	1 3/4 HP PLUNGE ROUTER	163
1613EVS	2 HP VAR SP PLUNGE ROUTER	183
1614	1 HP PLUNGE ROUTER	127
1614EVS	1 1/4 HP VAR SP PLUNGE ROUTER	148
1615EVS	3 1/4 HP VAR SP PLUNGE ROUTER	254
1654	7 1/4" CIRCULAR SAW	99
3050VSRK	9.6 V, VSR CRDLS DRILL W/2 BAT, CS	134
3258	3 1/4" PLANER	136
3282DVS	5" VS DUSTLESS RANDOM ORBIT	98
11203	1 1/2" ROTARY HAMMER W/STOP ROT	429
11304	THE BRUTE BREAKER HAMMER	1195
11305	DEMOLITION HAMMER	639

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0225-1	SAME AS ABOVE BUT W/KEYLESS CHK	114
0228-1	3/8" DRILL, VSR, 3.5 AMP, 0-1000 RPM	102
0230-1	3/8" DRILL, VSR, 3.5 AMP, 0-1700 RPM	114
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6527	SUPER SAWZALL W/BLADES & CASE	164
6528	SAME AS 6527 BUT W/PERMANENT CRD	164
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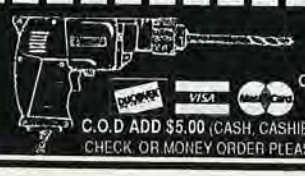

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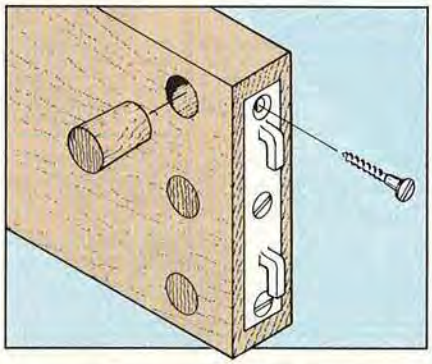
Continued from page 19

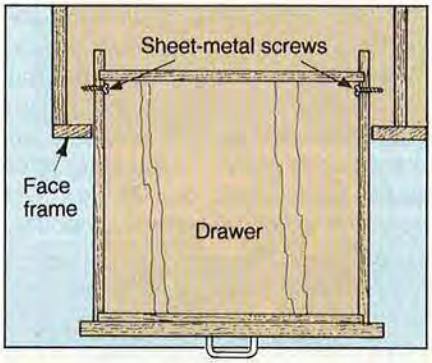
Here's a plug for end-grain joinery

You hate to drive screws into end grain because they can pull right out. But sometimes, you can't avoid driving them into the end of a board, as in the case of the bed hardware shown right.

TIP: For a strong joint, give the screw some face grain to dig into. Here's how: Drill a dowel-diameter hole through the face of the project part, located so that the screw threads will fall mostly or completely inside the hole. Then, glue a length of dowel into the hole. Set the grain on the end of the dowel perpendicular to the grain on the face of the project part. Cut the ends flush with your project part. Now, drill your pilot holes and drive in the screws.

—Tom E. Moore, Madison, Va.





Screws prevent dumping a full drawer on the floor

A drawer without stops will unload itself all over the floor if you aren't careful when you open it. Isn't there some simple way to limit a drawer's slide?

TIP: End unplanned drawer removals by driving a screw through each side of the drawer—from the inside. Drill a pilot hole near the upper back corner of each side, and then slide the drawer a few inches into its opening. Now, drive a 1½–2" screw into the pilot hole (a screw with threads all the way up to the head, such as a sheet-metal screw, works best). The screw points will catch on the inside of the frame so the drawer won't slide out accidentally.

—Al VandenBoogard, Appleton, Wis.

Continued on page 22

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TIPS FROM YOUR SHOP (AND OURS)

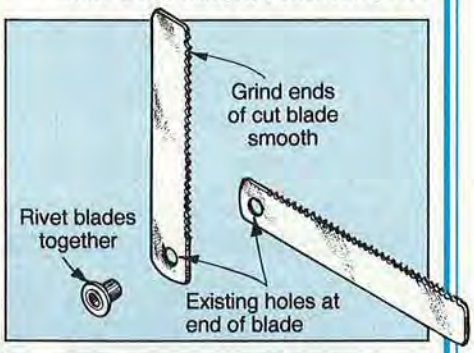
Continued from page 21

A little bitty bevel does a big-time job

There's nothing like a bevel gauge for transferring and marking angles accurately. When you're working in a tight spot, though, a standard one may be too large.

TIP: Make a smaller bevel gauge from the ends of an old hacksaw blade. Break the blade about 2½" from each end. Now, with the untoothed edges facing out, overlap the two pieces and rivet them together through the end holes. Make the joint tight enough that the gauge will hold an angle setting. Grind rounded corners on the broken ends. Grind the rivet as flat as possible, too.

–D. B. Gonzalez Jr., Pensacola, Fla.



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- Cut small pieces safely and accurately with a sliding auxiliary table for your tablesaw. See how to build one in the article about the stack-laminated bowl, starting on *page 46.*
- Building doors with glass inserts? Try our design, glass stops, and jig on *page 60.*
- Adapt our full-sized corner braces to your own project. We used ours on the mission chair on *page 72*, but you can count on them to add strength to a table or any project where two apron rails meet.
- Try our simple seat construction method in the same article to solve your own seating problems. It's shown on *page 78.*

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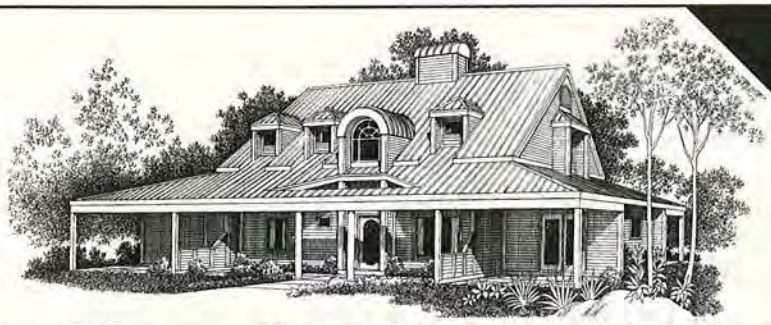

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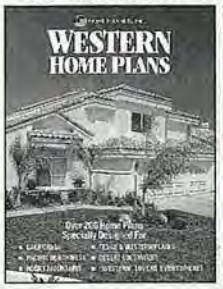

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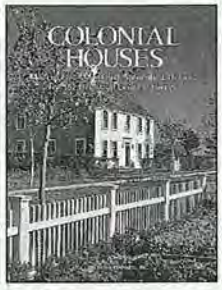

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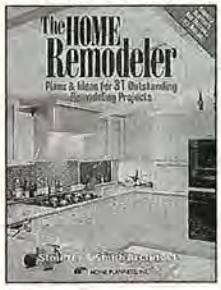

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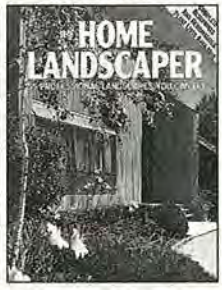

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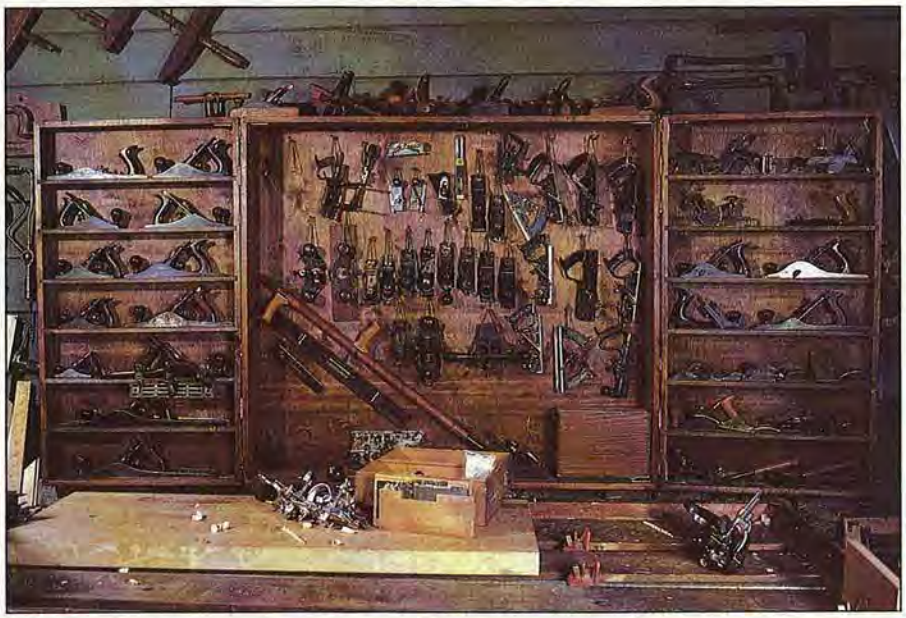
ANTIQUE TOOLS

WHAT YOU NEED TO KNOW ABOUT PRICES

Amazed at the price of many old hand tools? Here's why they sometimes prove costly, along with shopping guidelines the pros use.



A fine collection of old woodworking tools in good condition, like those in the above display, doesn't come easy, but that's the fun of collecting.

Tool collections normally don't accrue through the inheritance of old tools. Most collectors buy or trade for them. After all, that's part of the fun. But to avoid shelling out hard-earned money for hand tools not worth the price, it'll pay you to know a little bit about what makes them valuable.

The price of appeal

There are plenty of tools out there that have real, intrinsic value because they were made with or contain precious or semi-precious metals. Some old braces, for instance, carry silver or brass ornamentation. A tool can also have parts made from rare wood, such as the rosewood found in some levels and plow planes.

There are other reasons, though, for why a tool becomes a collectible. Tools representing a lost trade, skill, or technique such as coopering, always demand attention. So do the surviving tools of a limited line, or the few remaining examples of tools once mass-manufactured—Keen Kutter tools fit this category.

Then, there are the early variations of common, contemporary tools. They have value mainly due to the high quality of the materials and the evident craftsmanship, as in a rosewood-and-brass level.

But oddly, some potentially collectible tools will never attain a high value. One reason: size. An 8'-long ice saw from the early 1800s with a handcarved curly maple handle, for instance, will never have the appeal (or price) of a lovely ivory rule of the same vintage. That's because the saw presents display problems for most collectors.

How condition affects price

Serious collectors prefer buying one good or excellent tool to 10 or more beat-up versions at the same price. But what determines condition? Here's a checklist:

- **Usability.** A tool that's as useful now as it was when made always commands more money.
- **Finish.** If a tool—particularly a metal one, such as a plane—has 75 percent or more of its original japanned-black finish left, it falls into the better-than-good or excellent category. Don't bother with tools showing half or less.
- **Rust.** Light rust may be okay because you usually can remove it. Pitted steel lowers the value, except on primitive iron tools.
- **Wear.** Expect normal wear on handles, blades, and other working parts. No wear means it's new, and prime. A tool becomes especially desirable when accompanied by its original packaging. Avoid ones displaying heavy wear, such as a severely chipped and worn blade on a drawknife.
- **Originality.** The most valuable tools have all their original parts. The next most valuable ones have replacement parts of the same vintage. For example, a Phillips-head screw shouldn't substitute for a slot-headed one on a 1910 tool.
- **Maker's marks.** Look for clear, readable imprints; they add value, even to an otherwise drab tool.

It also helps to do some research before you shop for old tools. Here's a good reference: *The Antique Tool Collector's Guide to Value*, by Ronald S. Barlow, $14 ppd., from Windmill Publishing Co., 2147 Windmill View Road, El Cajon, CA 92020.

Photograph: David Jordan

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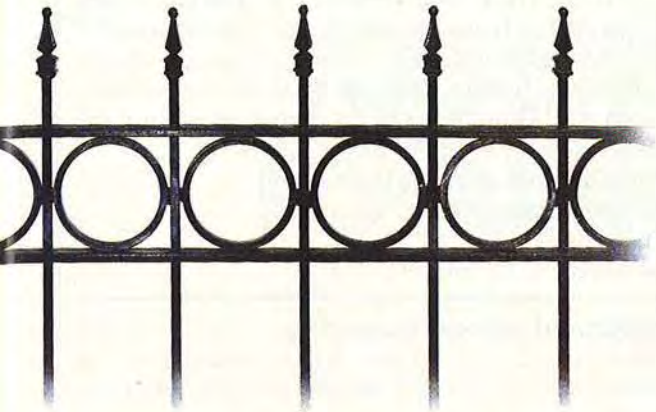

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Thin-skinned about veneering

This last year, I learned the art of veneer craft. It takes patience and a good deal of practice, yet I am very pleased with what I've done. I've discovered that by using inexpensive substrates [e.g., plywood, particleboard] and covering them with exotic veneers, I can create some beautiful, yet affordable pieces.

However, my numerous woodworking friends accuse me of being a "sleeze" for using veneers. They believe true craftsmen use only solid woods. And, I don't see much in *WOOD* magazine on this subject. What is the matter with veneering? Isn't it ecologically sound? Is it inferior craftsmanship?

—Rush Faber, Phoenix, Ariz.

We highly respect the craft of veneering, Rush. And, we've featured veneering several times in past issues such as this coffee table in issue 18. Ancient Egyptians began the practice by laying rare and colorful woods onto less-costly ones. Romans improved on the method by developing a bow saw that could cut even thinner veneers. Today, as in ancient times, veneering includes inlaying, marquetry, and sheeting for covering entire pieces.

John Docherty, lumber supervisor for Constantine's Woodworking Supply, Bronx, New York, says, "I think more woodworkers are turning to veneering because of the high cost of hardwoods, and because of the large selection of veneers to choose from. We stock 140 species of veneers." Are many of those on the endangered species list? "Only about ten of them," says John. "Actually, veneering is ecologically sound because it conserves hardwood species that take 150 years to mature."

If you'd like to learn more about veneering, Constantine's sells an informative book on the subject called, Veneering Simplified, *by Harry Hobbs. It sells for $9.95 plus shipping, and you can order one by calling 800/223-8087.*

Continued on page 29

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ASK WOOD

Continued from page 26

How about a budget IDEA SHOP?

I am planning a woodworking shop. I have no equipment and limited funds. Your IDEA SHOP would be wonderful, but also a financial impossibility for me. What can you suggest for equipment, tools, etc., that would form the basic woodworking shop? I have considered purchasing a ShopSmith, but am not certain if this would be the best route. Any help would be greatly appreciated.

—John Milton, Charleston, S.C.

You've asked the $64,000 question, John. Before you begin assembling your shop, you need to first determine the kind of woodworking you're interested in. Do you want to pursue scrollsawing? Carving? Woodturning? Furnituremaking? How about toymaking? All of the above? Each area requires its own primary pieces of equipment, though the versatile tablesaw fits in well with all of these woodworking pursuits as does a multiple-purpose tool like the ShopSmith.

If your interest lies in general woodworking, which would include the variety of projects you see in every issue of WOOD® *magazine, keep in mind that, beyond such basic hand tools as a hammer, chisels, screwdrivers, and square, you don't have to spend a fortune to get started. In fact, you might consider buying a few quality benchtop power tools. Costing less than full-sized stationary power tools (and taking up a lot less room), today's benchtop models can help you succeed at any number of projects. Tablesaws, drill presses, scrollsaws, bandsaws, lathes, belt/disc sanders—all come in benchtop sizes. And you can add a variety of portable power tools that include a router, random-orbit sander, drill, jigsaw, and circular saw.*

Our advice, however, is not to run out and buy everything we just discussed, but to let the project you're making dictate your tool purchases. That way, you can expand your collection gradually.

Continued on page 30

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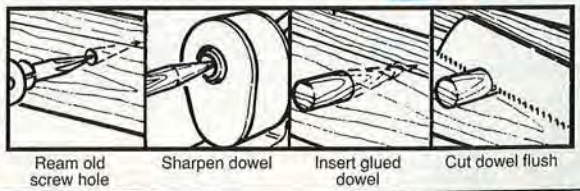

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ASK WOOD

Continued from page 29

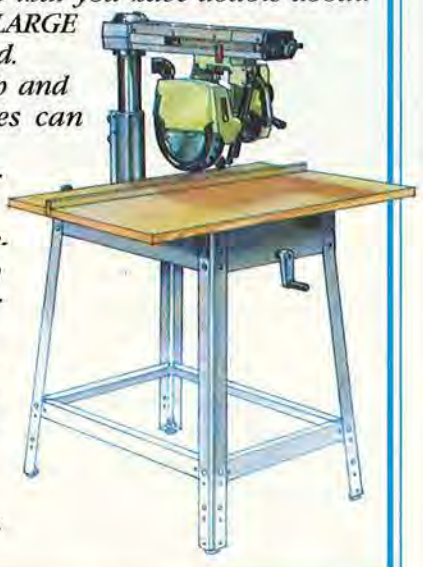
Plaudits for the radial-arm

About two years ago I had an accident with my tablesaw and nearly cut off two fingers. The saw cut I was making required removing the safety guard. I then met someone who told me that my accident wouldn't have happened on a radial-arm saw. This convinced me to buy one, and I can honestly say it was the best move I ever made. However, I only hear negative things about radial-arms concerning safety. Why is that? Why don't you show more project-building with this saw? Do you have something against them?

—Clifford Loiselle, Largo, Fla.

No, Clifford, we don't have a thing against radial-arm saws. Jim Boelling, our project builder, puts it this way: "We've essentially replaced the radial-arm saw in our shop with the sliding compound mitersaw. It can do most everything the radial-arm can do, except rip. For that we use the tablesaw. Both it and the mitersaw need realignment less frequently," he says. "As far as safety goes, we feel that any saw can be operated safely or unsafely." We recommend the following tips and the saw safety story in the February 1993 issue of WOOD® *magazine:*

1) *Always read your owner's manual, and then read it again.*
2) *Never make a cut that will place your hands dangerously close to the turning blade.*
3) *Stand aside from the piece that is being cut off.*
4) *Invest in foot switches, so you can turn off a machine when both hands are busy.*
5) *Don't attempt a cut that you have doubts about.*
6) *Make test cuts on LARGE pieces of scrapwood.*
7) *Keep tables smooth and slick. Sticky tables can spell trouble.*
8) *Keep all power tools and their parts—fences, arbors, and saw blades—in proper adjustment.*
9) *Keep your eyes on your work. Don't look away during a cut for any reason.*
10) *Wear safety glasses.*



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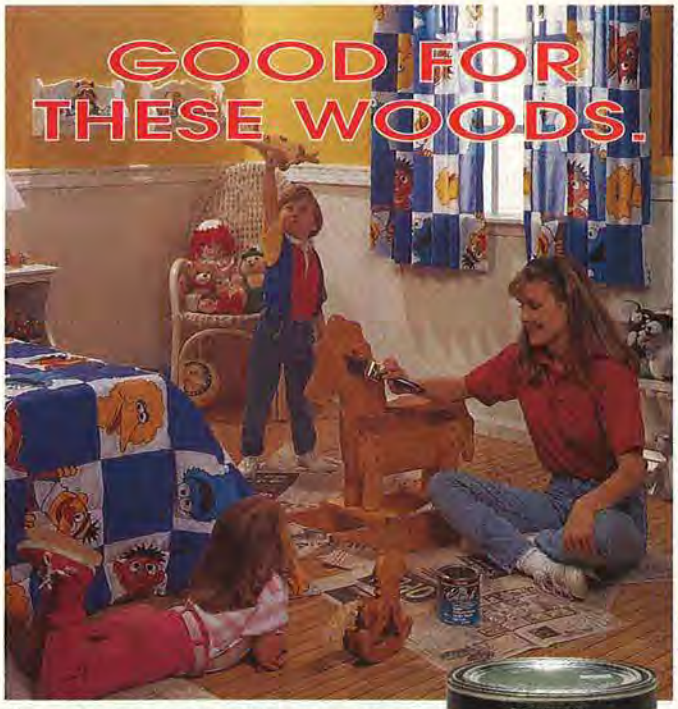

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ASK WOOD

Bringing laser technology home

In kit catalogs I frequently see fretwork items which have been cut by a laser, yet I never have seen home workshop projects cut this way. Is the "saw" too expensive? Are they even available to the home woodworker? I'm curious.

—Robert W. John, Winterville, Ga.

Bob, how about $40,000? Too expensive? While that price tag might keep a laser out of your workshop, as we reported in our September 1990 issue, no. 37, it doesn't have to keep laser technology away from your projects. Trophy and awards shops that use lasers for their engraving work will do your custom wood engraving (or cutting), too. Simply mark the stock with your design or pattern in solid black lines for the beam to follow. You can also use photographs. The service costs about $35 per hour, but lasers can execute even detailed designs quickly.

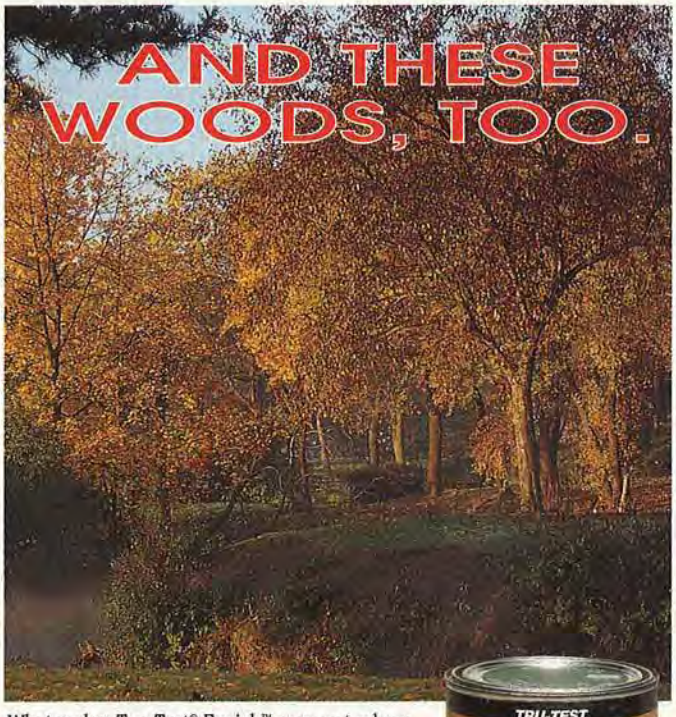
ASK WOOD

Cocobolo, the unfinished story

I bought some cocobolo wood hoping to make a card box. I cannot get it to take a finish. I have tried Formby's oil finish and polyurethane, but neither will dry on the wood. It stays tacky all of the time. Can you help?

—Glen Hendricks, Livingston, Tex.

Glen, we took your question to supplier Mitch Talcove of Tropical Exotic Hardwoods of Latin America. As you might expect, Mitch knows quite a bit about working with and finishing exotic woods. He recommends buffing cocobolo with a rag to smooth and prepare the surface, and then finishing with either furniture wax or lacquer. He warns against using an oil finish because it gums up. For more specific finishing information on this or other tropical hardwoods, call Mitch at 619/434-3030. He asks that you keep your questions short and to the point.



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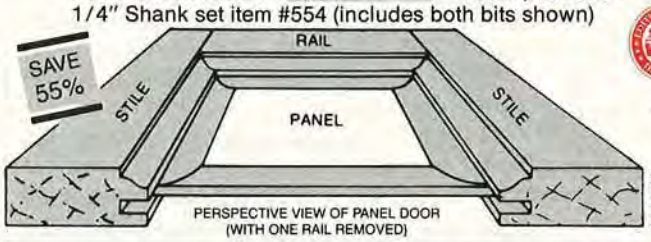
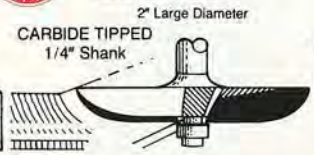


PERSPECTIVE VIEW OF PANEL DOOR (WITH ONE RAIL REMOVED)

RAISED PANEL BIT SUPPLIED WITH BALL BEARING



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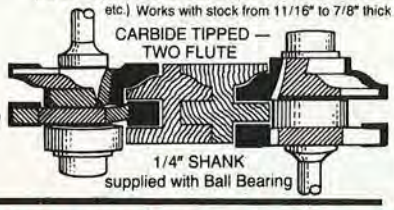

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#603		1/4" Spiral Cutter		1/4"	3/4"	1/4"	$12.00
#903		1/4" Spiral Cutter		1/4"	3/4"	1/2" *	$12.00
#904		3/8" Spiral Cutter		3/8"	1"	1/2" *	$24.00
#905		1/2" Spiral Cutter		1/2"	1 1/2"	1/2"	$29.00
#530		3/16" **Edge Beading**	3/16" Dia. of Circle		1/2"	1/4"	$15.00
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#350		1/8" **Round Over**	1/8" R	3/4"	3/8"	1/4"	$11.00
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#230		1/4" Round Over	1/4" R	1"	1/2"	1/4"	$12.00
#353		5/16" Round Over	5/16" R	1 1/8"	1/2"	1/4"	$14.00
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#199		**Multiform Moulding**	Unlimited Patterns	2 1/4"	2"	1/2"	$40.00
#205		1/4" **Cove**	1/4" R	1"	1/2"	1/4"	$12.00
#206		3/8" Cove	3/8" R	1 1/4"	9/16"	1/4"	$13.00
#207		1/2" Cove	1/2" R	1 1/2"	5/8"	1/4"	$14.00
#643		1/2" Cove	1/2" R	1 1/2"	5/8"	1/2"	$15.00
#208		3/4" Cove	3/4" R	1 7/8"	3/4"	1/2"	$26.00
#231		5/32" **Roman Ogee**	5/32" R	1 1/4"	15/32"	1/4"	$16.00
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#211		3/8" **Core Box**	round nose	3/8"	3/8"	1/4"	$10.00
#212		1/2" Core Box	round nose	1/2"	11/32"	1/4"	$13.00
#418		3/4" Core Box	round nose	3/4"	5/8"	1/4"	$15.00
#213		1" Core Box	round nose	1"	3/4"	1/2"	$17.00
#548		**Lockmitre**		2"	7/8"	1/4"	$32.00
#214		1/4" **Straight**	plunge cutting	1/4"	3/4"	1/4"	$ 6.50
#216		3/8" Straight	plunge cutting	3/8"	1"	1/4"	$ 6.50
#474		1/2" Straight	plunge cutting	1/2"	1"	1/4"	$ 7.00
#219		3/4" Straight	plunge cutting	3/4"	1"	1/4"	$ 9.50
#779		3/4" Straight	plunge cutting	3/4"	1 1/2"	1/2"	$10.00
#462		1/2" **Bull Nose**	1/2" Dia. of Circle		3/4"	1/4"	$16.00
#464		3/4" Bull Nose	3/4" Dia. of Circle		1"	1/4"	$21.00
#764		3/4" Bull Nose	3/4" Dia. of Circle		1"	1/2"	$21.00
#545		**Tongue & Groove**	Straight	1 5/8"	1"	1/4"	$29.00
#845		Tongue & Groove	Straight	1 5/8"	1"	1/2"	$29.00
#546		Tongue & Groove	Wedge	1 3/16"	1"	1/4"	$29.00
#846		Tongue & Groove	Wedge	1 5/8"	1"	1/2"	$29.00
#450		1/8" **Beading**	1/8" R	3/4"	3/8"	1/4"	$11.00
#233		1/4" Beading	1/4" R	1"	1/2"	1/4"	$13.00
#454		3/8" Beading	3/8" R	1 1/4"	5/8"	1/4"	$15.50
#455		1/2" Beading	1/2" R	1 1/2"	3/4"	1/4"	$17.00
#500		3/8" **Flush**	**Trimming**	3/8"	1/2"	1/4"	$ 7.00
#501		3/8" Flush	**Trimming**	3/8"	1"	1/4"	$ 7.50
#503		1/2" Flush	Trimming	1/2"	1"	1/4"	$ 8.50
#221		1/2" Flush	Trimming	1/2"	1 3/16"	1/2"	$ 8.00
#558		**Thumbnail**		1 3/16"	3/8"	1/4"	$18.50
#858		Thumbnail		2 1/2"	3/4"	1/2"	$35.00
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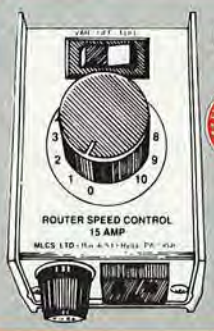

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WHITE OAK

The weatherproof stock of Old Ironsides, barrels, and mission furniture

When England sought wood to rebuild her once-great naval fleet, eyes turned to the American colonies' forests of white oak because by the 1700s, English oaks had all been felled. British shipbuilders, though, scorned New World oak as inferior.

Proud American builders knew better, and built ships of native timber. The famed frigate *Constitution*, known as Old Ironsides, had a gun deck of Massachusetts white oak, a keel from New Jersey white oak, and frame and planks from magnificent Maryland trees.

As New England sea captains went on to sail their all-American, white-oak ships to the far corners of the world, another growing industry also made far-reaching use of the wood. Ever since colonial times, coopers had hand-riven staves of white oak for barrels. And as the young nation's merchant fleet increasingly sailed the seas, it carried with it more and more cooperage for export trade. Some of it was bound for France's vineyards, or to the West Indies for barreling rum and molasses.

Later, during the Victorian Age of the late 1800s, still another use emerged—as a fine furniture wood. Stained and highly varnished, it was sold as Golden Oak, and attained a popularity that persisted through the mission furniture of the 1920s. Today, even though somewhat revived for furniture and cabinets, white oak represents less than one fifth of all oak—red and white—harvested in the U.S.

Natural range

Wood identification

Although you can find dozens of species of white oak growing nearly everywhere in the U.S., the grandest of them all is *Quercus alba*. Called stave oak and fork-leaf white oak, the tree can grow to ponderous size within its range. Trees more than 8′ in diameter and over 150′ tall have been recorded. Usually, the trees fall between a 3–4′ diameter and an 80–100′ height.

You can easily identify white oak by its round-lobed leaves (red-oak leaves have sharply pointed lobes). In the absence of leaves, check for white oak's telltale light, ash-gray bark with its scaly plates. Or, look for acorns. Those of the white oak have a shallow cap with an inside that's satiny smooth. The red-oak acorn cap is hairy inside.

The wood of white oak isn't white as the name implies. It's tan. And unlike the end grain of red oak, which displays large open pores, that of white oak shows a tightly closed formation. Weighing about 47 lbs. per cubic foot dry, white oak features a straight, coarse grain that when sawed on the quarter often produces a rippled figure.

Uses in woodworking

Unlike red oak, white oak resists moisture and decay, making it ideal for outdoor furniture and boats. Indoors, it's a cabinet-class wood for tables and chairs, floors and trim, and turnings. Basketmakers also rely on the green wood. But, due to its hardness, carvers aren't fond of it.

Availability

The lumber industry lumps all white oaks together, so you may not always be getting *Quercus alba*. Don't worry, all species share the same wood traits.

Widely available at hardwood suppliers, white oak costs about $2 per board foot; triple that price for quarter-sawed wood. Veneer runs about 50 cents per square foot, and white-oak plywood is widely sold.

Continued

PERFORMANCE PROFILE

white oak
(Quercus alba)

Flat-sawn white oak

Quarter-sawn white oak

White oak requires careful handling during the drying process to ensure boards free from seasoning defects, such as internal honeycombing, so closely check any questionable boards before you buy. You also might inquire about the source of the wood. Slower-grown wood from the Appalachians and the north offers an easier-to-work texture than that from southern bottomlands, although they may look the same.

Machining methods

White oak's hardness requires power tools, but it shouldn't give you any problems as long as you keep the following in mind:

- Because white oak dulls cutting edges, use carbide-tipped cutters and saw blades.
- The wood's straight grain presents only moderate resistance to ripping, but its hardness demands a slow feed rate.
- White oak also has a greater tendency to splinter than red oak. That means that you should take a few shallow passes on the planer or jointer when removing stock.
- When routing white oak, especially end grain, also take shallow passes. And be sure to use a backing board on cross-grain cuts for splinter- and chip-free machining.
- In counterboring, only quarter-sawed or rift-cut white oak presents a problem. The eye-appealing rays may lift or chip out, so work slowly. This hard wood also requires slower speeds (about 500 rpm or less) on the drill press.
- Again, the wood's hardness requires sanding with progressively finer grits. And don't attempt to orbit-sand this species because swirl marks are hard to remove.
- White oak's high tannic acid, when used for outdoor projects, will turn ordinary screws black and stain the wood. Although they cost more, use brass or stainless steel fasteners for long-lasting good looks. And always predrill white oak for fasteners.
- Don't use casein glue with white oak. Its components react with the high tannic acid content of the wood and the bond won't properly adhere.
- White oak responds to all stains and finishes well, and unlike open-grained red oak, there's no need to fill for smoothness.

Carving comments

Armed with a mallet and very sharp gouges (or power-carving tools), only determined carvers tackle white oak. One tip: Grind cutting edges to a deep bevel of 25°–30° for roughing in. For the shallower, shaving cuts of detail work, return to 15°–20° bevel.

Turning tricks

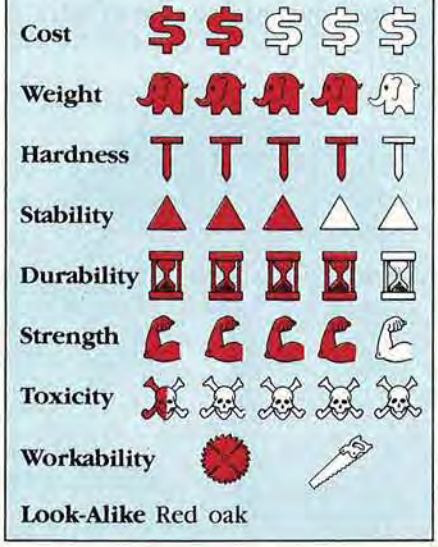
- For turning between centers, avoid splintering by entering the wood with a sharp, clean-cutting tool, such as a skew, and take shallow cuts.
- Sharpen your turning tools more frequently when working white oak so that they never abrade the wood.

SHOP-TESTED TECHNIQUES THAT ALWAYS WORK

Any exceptions—and special tips pertaining to this issue's featured wood species—appear under headings elsewhere on this page.

- For stability in use, always work wood with a maximum moisture content of 8 percent.
- Feed straight-grained wood into planer knives at a 90° angle. To avoid tearing, feed wood with figured or twisted grain at a slight angle (about 15°), and take shallow cuts of about 1/32".
- For clean cuts, rip with a rip-profile blade with 24–32 teeth. Smooth cross-cutting requires at least a 40-tooth blade.
- Avoid using twist drills. They tend to wander and cause breakout. Use a backing board under the workpiece to reduce tearout.
- Drill pilot holes for screws.
- Rout with sharp, preferably carbide-tipped, bits and take shallow passes to avoid burning.
- Carving hardwoods generally means fairly shallow gouge bevels—15°–20°—and shallow cuts.

WHITE OAK AT A GLANCE



Look-Alike Red oak

Compiled with woodworkers Jim Boelling and Don Wipperman Illustrations: Steve Schindler

DARKHOUSE DECOYS

They're cute, colorful, and, as one of the oldest forms of folk art, very collectible. That's why New York carver Ray Zelinski sells as many of these wooden facsimile fish as he can make.

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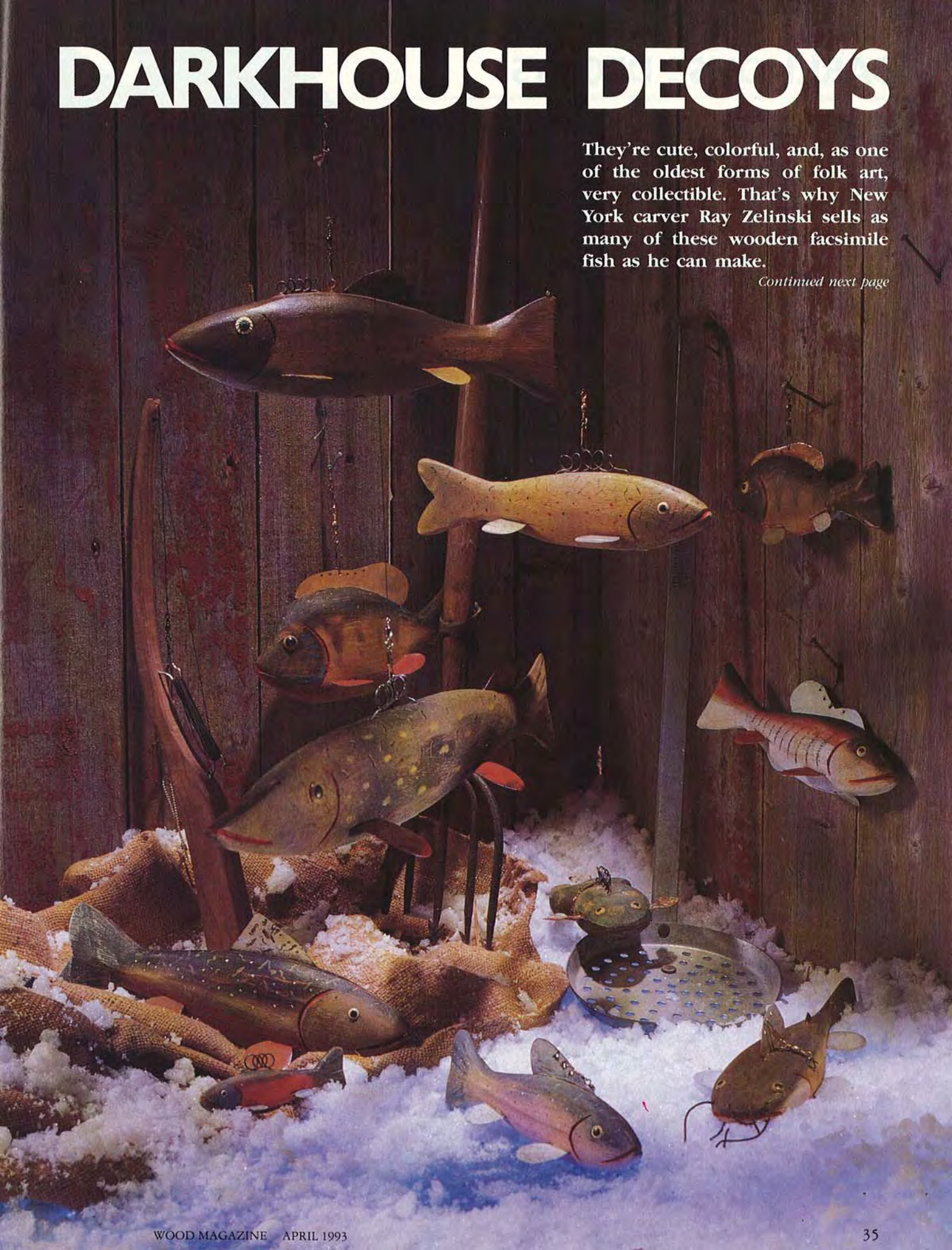


DARKHOUSE DECOYS

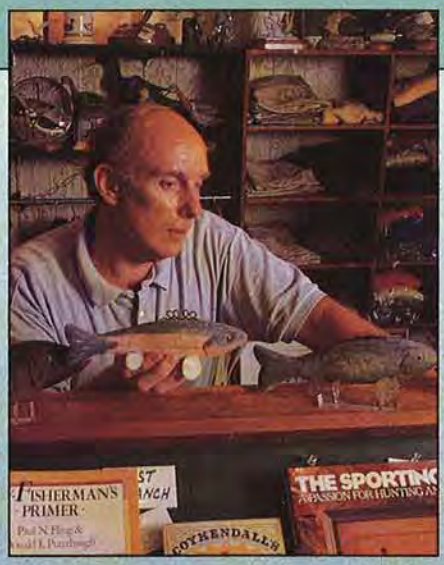
A showy, eye-catching sunfish, about 6" long

It may have been as long as 10,000 years ago that the first fish was speared through a hole in the ice in North America. No historian can say for sure. But log books of New World settlers verify that Native Americans speared fish at all times of the year, making spearing one of the oldest forms of fishing.

The method employed in winter proved particularly interesting, though simple. An Indian brave would lie facedown on the ice covered by a pole-supported robe that allowed a few feet of vertical movement. Through a hole he had chipped in the ice, he dangled as an attractor a wooden fish decoy from a line held in one hand. In the other hand was a two-pronged spear at the ready. When a large fish glided into view, he aimed and unleashed it. The result: A fine supper.

Today, in the six states that still allow spearfishing, this ancient method has changed little. A hut—called a darkhouse by spearers—with a hole in the floor replaces the Indian's crude tent. The spear now has steel prongs rather than ones of bone. And the ice hole, often 4x6', is cut with a power auger instead of with a knife of flint.

Certainly, the decoy remains the same: handcarved and painted, delicately weighted and balanced, and suspended by line to tantalizingly dance and swim. Yet, few of those who now admire and buy these fanciful bits of folk art fully understand their traditional purpose. Nor will they use them as originally intended. To Ray Zelinski, decoy carver extraordinaire, educating buyers goes along with selling.



Ray's decoys sell at The Bedford Sportsman, in Bedford Hills, New York.

Nine months of the year, Ray teaches social studies to middle-schoolers in Yorktown Heights, New York. During summer, he and a partner restore and remodel houses. But in his spare time, Ray, 46, makes fish decoys.

"Last year, in less than a full 12 months, I probably sold 150 decoys," he says. "The largest was about 24" long. But I make them in all sizes, from 3" miniatures that collectors call minnows, to 26". The most popular size, though, seems to be the 7–12" range. And on the average, I'll get $6 or $7 an inch."

Ray responds to the natural, but unasked, question. "Who buys them? A couple of different kinds of people," he begins to explain.

"First, there's the new collector. Until the American Museum of Folk Art in New York held their exhibit called 'Beneath The Ice: The Art Of The Fish Decoy,' in 1990, the public knew little of fish decoys. Now, they're hot."

Ray notes that scarce original decoys from the 1920s through the 1950s (few have survived the ordeal) can bring as much as $6,000 at auctions. That makes new decoys, made to replicate the old timers from the Great Lakes states, desirable as collectibles because they're affordable.

"Then, of course, sportsmen—especially fishermen—buy my decoys. Not to use, although they could, but just as part of the tradition," Ray comments. "And next there's the latest buyers—the decorators. Look at any magazine that shows country decorating. You'll see fish decoys somewhere as accent pieces. Why, you can even spot them hanging in New York City apartment windows!"

Ray, one of a dozen or so carvers from across the country that produce fish decoys, began carving as a hobby. Always an outdoorsman, he had carved for relaxation, even while in college.

"I used to carve ducks, and some fish decoys. But to make extra money, I tied fishing flies," he comments. "When I moved here from Pennsylvania in 1968, I concentrated on fish decoys. I'd carve them to give away to friends. Gradually, people heard about me—a friend would tell a friend."

Eventually, Ray entered his work in a couple of New England arts and crafts shows, and won ribbons. Then came the American Museum of Folk Art exhibit, where his decoys were selected to be sold through the museum shop. Ray's work took off.

"It just turned into a business," he says. "I never expected to wind up carving this many decoys."

Wooden fish that swim?

Ray doesn't rely on reference books to shape and color his fish, he knows from hands-on experience what they should look like. "I guess I fished so much [and he still does] that I developed an eye for what a fish shape should be—a brook or rainbow trout, a sunfish, or a northern pike," Ray says. "I don't try to make them look like a piece of sculpture, and they don't have to be detailed. My decoys are made for fishing."

So, how do you fish a wooden decoy? Believe it or not, there's a bit of technique involved:

Imagine the lone spearer holed up in a darkhouse on a frozen northland lake. It's mid-morning, but the only light comes from the rectangular hole in the ice before him. Through it, he can see the lake bottom six or eight feet below, eerily illuminated by the penetrating sun as if by several submerged fluorescent lights.

There's a stillness as he watches the underwater world. Suddenly, a large shape flashes into the aquarium-like scene, but just momentarily. A feeding pike!

What will bring the fish back? The spearer picks among his decoys, finally selecting a 7"-long perch imitation. Fighting the nervousness of anticipation, he attaches the clip of the jigging line to one of the several holes punched in the decoy's dorsel fin. That hole, the farthest forward, will give the wooden fish a slight upward pitch, as if it were injured—easy prey for predator pike.

Next, one hand bends each metal fin slightly, assuring a slow natural spiral when lowering the decoy in the water. Finally, the spearer twists the line attached to the jigging stick, knowing that as it unwinds the decoy will "swim" through the water. Now he lowers the decoy, focuses on the

Continued

Ray gradually shapes a mahogany blank into a decoy—all by eye.

The molten lead that weights a decoy also fastens its fins permanently in place. This decoy will weigh about a half pound.

One of Ray's largest decoys, this northern pike measures 18" long. In waters where muskies prowl, it represents an average meal.

scene below, and, spear in hand, patiently waits for the long, dark shadow to return within range.

Free supplies: Scrounging often has its rewards

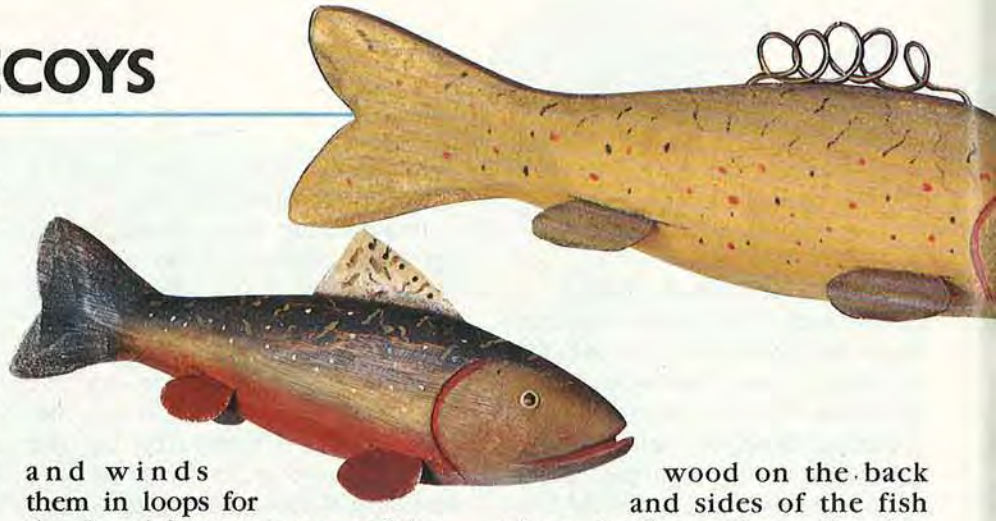
Ray's customers don't venture to the cold blackness of a darkhouse to test their purchases. Yet, they could if the spirit moved them, because Ray puts everything into his wooden fish that former fish decoy carvers did. But, he makes no claim to the historical authenticity of his materials.

A decoy begins as a profile sketch on heavy paper. From that, the carver cuts a template and transfers the pattern to an appropriate block of wood. Then, he saws it to rough shape on the bandsaw. After that, with only his eyes as a guide, Ray hand-carves the decoy to final shape.

"Right now, I use Philippine mahogany for the bodies because I have access to an awful lot of it," he notes. "It carves and sands easily, and takes paint well. But, I've carved them in white pine, too."

Ray gives some of his fish built-in motion by carving them with a slightly curved tail. Others look plaque-like, nearly flat as a board. Some get an articulated tail, meaning it will be a separate piece, attached via a pinned mortise.

Dorsel and other fins Ray makes from practically any material that can be cut and bent. "The Indians used pieces of birch bark or leather," he comments. "But I get by with pieces of tin cans, metal from spinner blades, copper from old lithograph plates, whatever I can find." He even extracts individual wire strands from salvaged heavy duty electrical Romex and winds them in loops for the dorsel fins on some models.



For the weight that fills his decoys' innards, Ray melts down scraps of sheet lead supplied by a plumber friend. "In making fish decoys, scrounging around becomes a necessity," he laughs. "I look for potential materials when I'm about. Like what I use for eyes—they're upholstery tacks."

Fantasy finishes beneath the ice

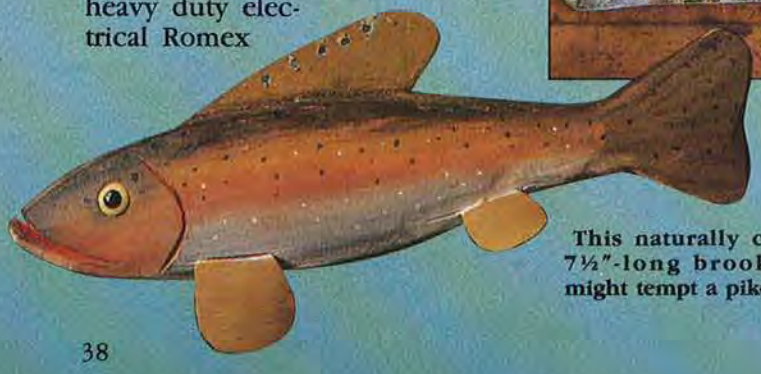
Before Ray paints a decoy, he installs the fins. Working from the belly side of the decoy, he hollows out a cavity in the body by drilling several holes, and then removes the remaining wood with a carving knife. Next, with the knife point, he slices through the wood on the back and sides of the fish where the fins will go. The thin metal easily slides into the slots.

"I make sure that the base of each fin protrudes into the cavity," Ray explains. "That way, when I fill the cavity with the molten lead, it anchors each fin in place as it sets up." The method proves as durable as the finish.

"I like to paint with acrylics because I can blend the colors, they dry fast, and hold up," he says. "Oils will eventually crack."

So that the colors he chooses stand out, Ray begins painting by applying a white base coat. Then he adds the colors one at a time, following no specific pattern. "When you paint fish decoys, you develop an eye for what looks appealing," he notes.

Colors for the catfish and other fish decoys don't have to be realistic, so Ray's paint palette contains a real rainbow of hues.



This naturally colored, 7½"-long brook trout might tempt a pike.

Ray calls this 8"-long decoy a "trout type" because its color isn't realistic, although the silver and red decoy definitely is a rainbow trout. Note the two styles of dorsel fin for line attachment.

Ray has also learned a trick that adds to his decoys' appeal—erasing color. By softly rubbing areas of paint with his finger, he creates spots where the wood grain shows through—seemingly worn off from seasonal use.

After adding the accents of eyes, stripes, dots, and scales that make one type of fish different from another, Ray puts on the finishing touch: wax. "I like to rub them down with Minwax. It gives the decoy a mellow look—a slight sheen. Plus, if someone did want to fish them, the wax coating protects the finish."

Decoy buyers beware: You can get lured in

According to Ray, some people have collected fish decoys for 20 years or more. But it's only been in the last few that decoys have become the rage. And when something becomes that popular, it's time for buyers to beware.

"I could take you to one of the East's biggest flea markets and show you endless numbers of decoys," he says. "And lots of them come from the Philippines and Taiwan where they're cranking them out and spray painting them 1,000 at a time. They don't even bother to weight them.

"But the biggest danger right now, with the market being so high," he cautions, "is someone who takes one like mine and unscrupulously antiques it further, then tries to pawn it off as an authentic old one at a collector's price. It's like an open season on the uneducated. People should ask for documentation for claims that prove that the decoy they're looking at is authentic."

In an opposite direction, some modern makers sell decoys so detailed that Ray feels they lose any sense of uniqueness or individual style. "Those decoys look like snapshots of the real thing. And it's sad," he adds. "Take one of the old carvers, like Oscar Peterson or Hans Janner. They simply carved what they thought [the decoy] should be—a general form with some paint on that was meant for spearing. It had style."

Ray stripes a perch with red acrylic paint. "Open-grained mahogany soaks up paint, but then I rub some of it off," says Ray.

When completed, this 7"-long perch will sell for about $45. A light coat of Minwax, applied after painting, mellows the paint, adding to the patina and appeal of the decoy.

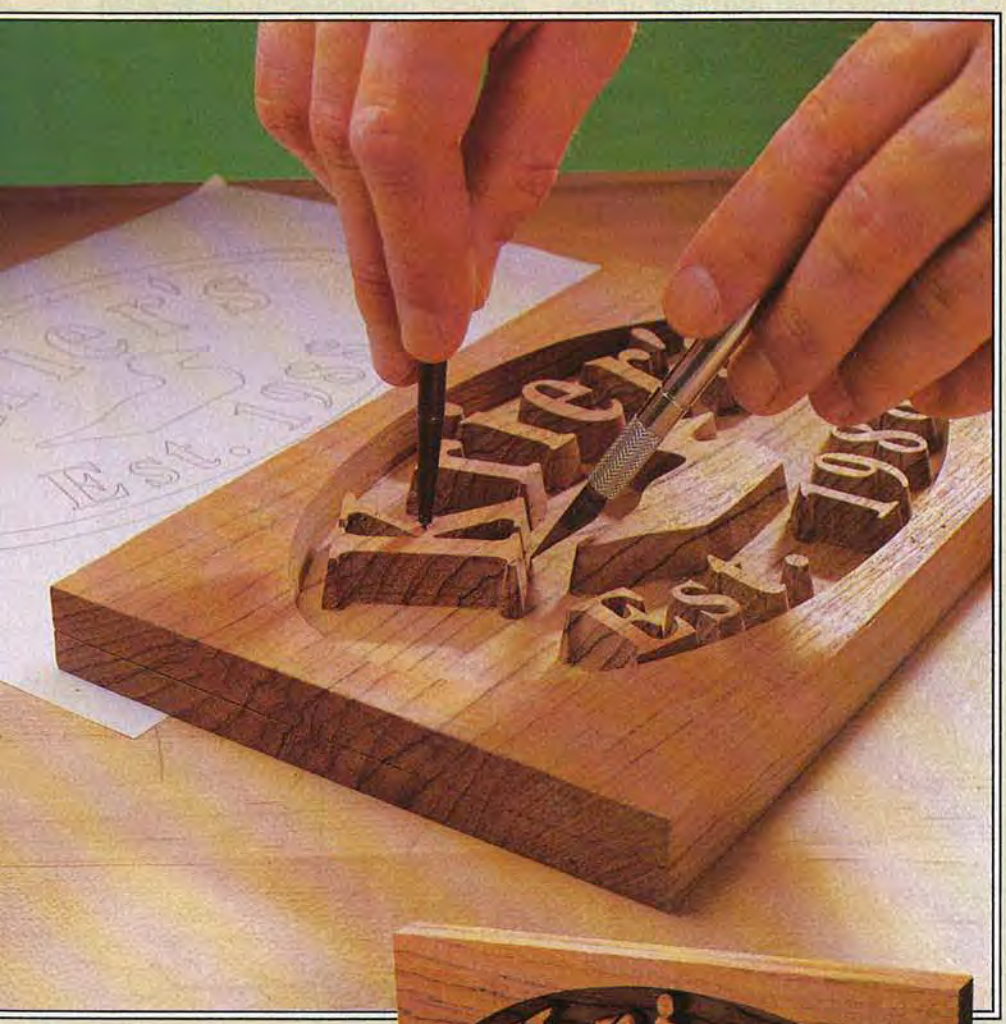
Have you been decoyed?

For a description and price list of Ray's fish decoys, send a SASE to: *R-Z Decoys, 190 Moseman Rd., Yorktown Heights, NY 10598.*

Written by Peter J. Stephano
Photographs: Wm. Hopkins, Jerry Irwin

SIGN-MAKING MADE EASY

CREATE YOUR OWN DESIGNS AND SCROLLSAW THEM OUT IN A JIFFY



Sure, you can make relief signs by routing or carving, but once you team up a bandsaw with a scrollsaw to do them, you may never return to your old ways. While this simplest-of-all third approach saves time, its greatest reward lies in the crisp, well-defined relief lines that give your signs increased readability and a sharp look. Here's how to do it.

First, lay out your sign

After deciding on your sign's message, sit down and draw a rough sketch of what you want it to look like. When sizing the sign, keep in mind the maximum cutting height of your bandsaw for resawing operations. As you'll see later, signs higher than the maximum cutting height of your bandsaw require additional steps as described on *page 43*.

No matter what sign shape you choose, it should have a frame that surrounds the letters and extends to the sign's perimeter. You can make the frame into a circle, rectangle, or free-form—any shape that complements your message. In the sign *left*, we chose an oval frame for added interest.

You say you don't have access to an alphabet? Not to worry. We've included letters and numbers with this story; use and reuse them as much as you like. You can enlarge them on many photocopiers, but we advise against making them any smaller. Why?

Print this article

FULL-SIZED ALPHABET PATTERNS

- Scrollsaw blade start hole (use 1/16" drill bit)

Aa

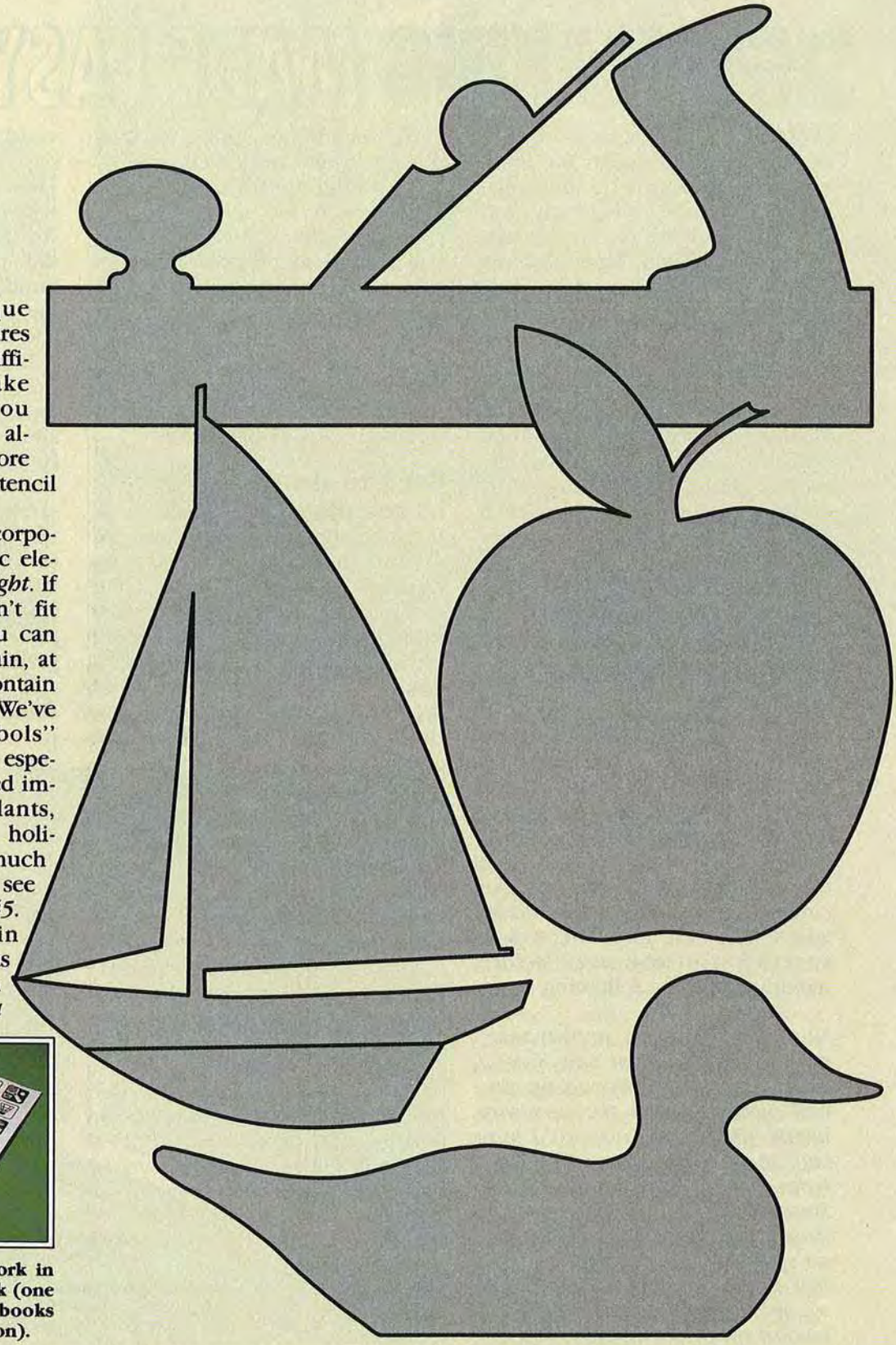
The scrollsawing technique shown in this article requires bevel cuts that you'll find difficult or impossible to make with smaller letters. If you would like to try another alphabet, visit an art-supply store and check out its stock of stencil or transfer (rub-on) letters.

You also may want to incorporate into your sign a graphic element such as those shown *right*. If one of these symbols doesn't fit the theme of your sign, you can purchase clip-art books—again, at an art-supply store—that contain hundreds of other symbols. We've found the "Graphic Symbols" clip-art book shown *below* especially useful. It has silhouetted images depicting animals, plants, foods, tools, toys, hobbies, holidays, vehicles, sports, and much more. To obtain your copy, see the Buying Guide on *page 45*.

To make a pattern, begin with a blank sheet of paper as big as your sign. With a

Continued

A sampling of some of the artwork in the Graphic Symbols clip art book (one in a series of Graphic Source books from Graphic Products Corporation).



Bb Cc Dd Ee

SIGN-MAKING MADE EASY

pencil draw guidelines on the paper that help you align the letter bottoms. If you go with the alphabet shown here, photocopy and cut out each letter or number that you'll need. Then, tape or paste the characters on your guidelines, paying attenion to spacing the letters or numbers in a pleasing way. (If using transfer or stencil letters, you'll need to rub-on or trace the characters along the guidelines.) Finally, photocopy, cut out, position, and affix any graphic elements. After completing your design, photocopy it to make a cutting pattern for the next steps.

Choose the perfect piece of stock

For our sign we chose teak because of its weather resistance and attractive grain pattern. The prominent grain lines also help you in assembling the sign later, but less-figured woods such as Honduras Mahogany work well, too. Other species to keep in mind for outdoor signs include cedar, redwood, white oak, and cypress. Whatever species you decide on, remove any planer marks and smooth the face side with a succession of abrasives before moving on to the following steps.

***Note:** For the best appearance, make your sign from one piece of stock, rather than edge-gluing several pieces to gain the necessary width. Wide signs (over 10") may cup, so we advise you make these from several edge-joined pieces. For outdoor signs, be sure to use a water-resistant glue such as slow-set epoxy or Franklin Titebond II. If you must glue up the stock, do so only after you read the next section on preparing your stock.*

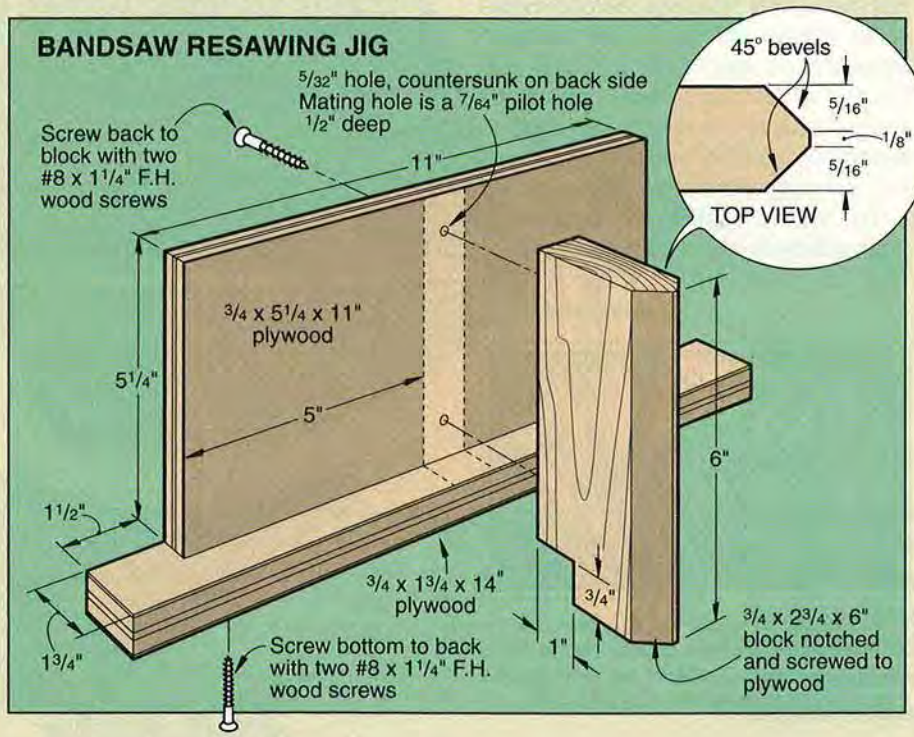
The techniques and letter sizes suggested here work well with ¾" stock. If you use thinner material, you'll lessen the relief effect. If you choose stock thicker than ¾", you'll need to proportionally increase the minimum size of the letters and numbers. For example, with 1½" stock, enlarge the alphabet shown here to twice its size. Otherwise, you may have difficulty making some of the beveled scrollsaw cuts in tight areas.

Get into the thick of it by resawing your stock

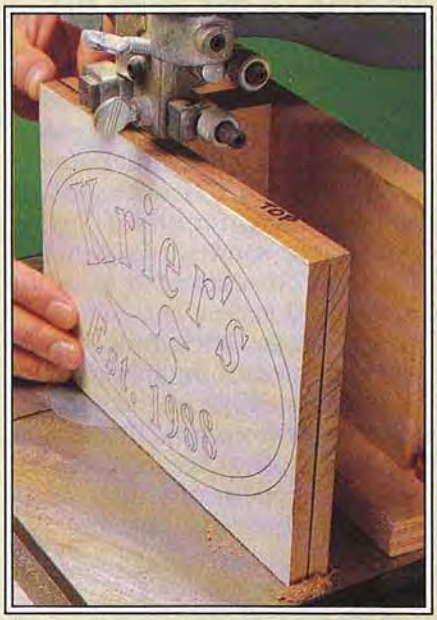
If the height of your sign does not exceed the maximum resawing capacity of your bandsaw, attach a copy of the pattern to the face side of the workpiece (rubber cement works well). Then, mark a resaw line along the top edge of the workpiece that's centered on the stock's thickness. Mark the word "top" on the side of the resaw line opposite the pattern. Then, with a ¼"-or-wider blade with 6 teeth per inch, resaw the workpiece as shown *right*. To do this accurately, we suggest you build the simple bandsaw resawing jig shown in the photo *right* and illustrated *below*.

Position and clamp the resawing jig to your bandsaw table so that you can guide the workpiece along the pointed edge of the jig. Be careful to align the jig parallel with the blade and workpiece. To safely resaw the sign stock, push it through the blade until you come to within about 3" of the end of the workpiece. Then, pull both resawn pieces (called the *pattern piece* and *background piece*) completely through the blade.

If the height of your sign exceeds the maximum resawing capacity of your bandsaw, as shown

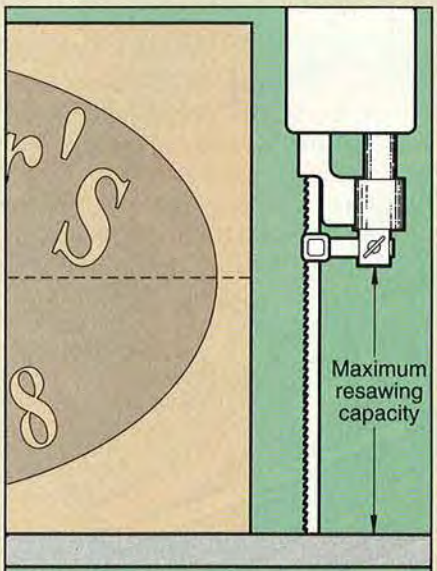

BANDSAW RESAWING JIG
5/32" hole, countersunk on back side
Mating hole is a 7/64" pilot hole
1/2" deep
Screw back to block with two #8 x 1 1/4" F.H. wood screws
11"
45° bevels
5/16"
1/8"
5/16"
TOP VIEW
3/4 x 5 1/4 x 11" plywood
5 1/4"
5"
6"
1 1/2"
3/4 x 1 3/4 x 14" plywood
3/4"
1"
1 3/4"
Screw bottom to back with two #8 x 1 1/4" F.H. wood screws
3/4 x 2 3/4 x 6" block notched and screwed to plywood

Ff Gg Hh Ii



A simple resawing jig helps you follow your marked line. Note that we marked "top" on the background piece to aid in assembling the sign later.

Tilt your scrollsaw table 10° to the left or right and keep the waste side of the cut on the downhill side of the blade.



Pieces that exceed the maximum cutting height of your bandsaw should be ripped to a width that can be resawn. After resawing, edge-glue the pieces back together.

in the drawing *left,* rip your workpiece into widths that fit underneath the saw's upper guide assembly. Or, make the sign from several workpieces, none of which exceed the maximum resawing capacity of your bandsaw. (For best results, pay careful attention to matching the color and grain of the workpieces.)

In any event, mark the faceside of each workpiece. Then, number both faces of each of the workpieces in their glued-up order to help you keep them straight later. Resaw each piece as described on the *previous page.* Then, assemble the resawn pieces in the correct order and edge-glue them, being careful to make your glue-ups as flat as possible. Now, affix your pattern to the face side of your pattern piece.

Now, for best results, bevel-cut your sign

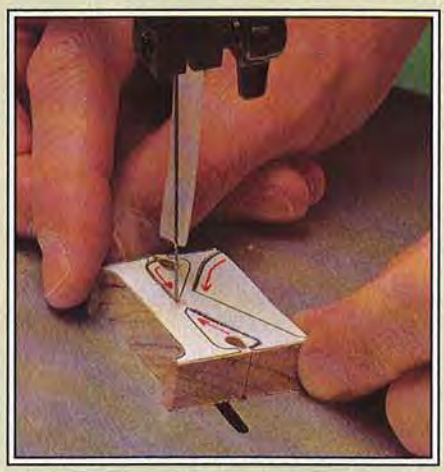
To add visual interest to your sign, make all of your scrollsaw cuts at a 10° bevel. (We used a no. 5 blade—one that's .038″–.039″ wide, .015″–.016″ thick, and has 12½–16½ teeth per inch.) To do this, you need to tilt your scrollsaw table 10° to the left or right. Then, as you cut along the pattern lines, rotate the workpiece to keep the waste side of the cut on the low "downhill" side of the blade as shown *above.* (The letter, symbol, or other piece that will be a part of your sign stays on the high "uphill" side of the blade.) This technique can be tricky until you get used to it, so practice on scrap before tackling your sign. In no time you'll develop a knack for this procedure.

Continued

Jj Kk Ll Mm

SIGN-MAKING MADE EASY

Because of the bevel, you will find that you can't turn tight corners as you normally can with a scrollsaw. So, when cutting into an inside corner, you need to first cut along one side and stop when you reach the corner's point as shown *right*. Then, turn off the machine, back the blade out of the cut, tilt the table 10° the other direction, and cut the opposite side of the corner to complete the cut. To save time, make cuts along one side of each inside corner in your workpiece before tilting the table. If your table tilts in only one direction, see the boxed information *below*.



Cut just one side of tight corners (as shown by the arrows), and then tilt the table and cut the other side.

It's time to put all of the pieces back together again

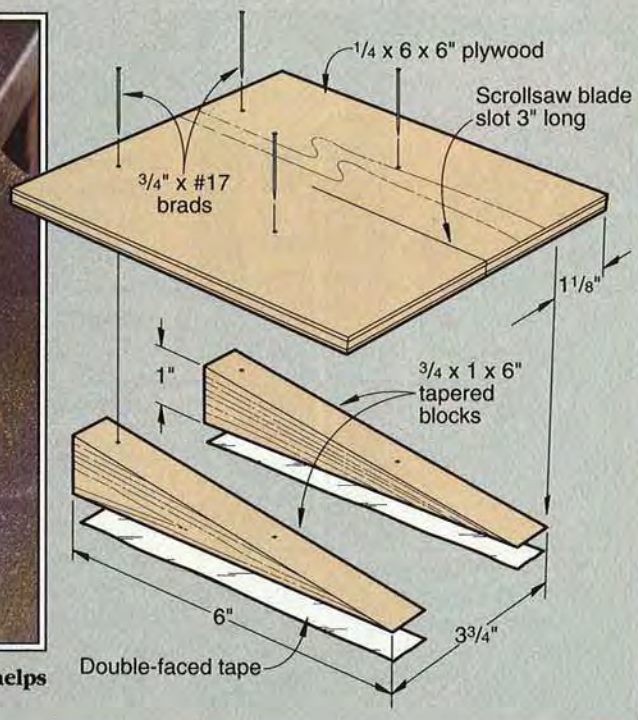
With your parts cut from the pattern piece, you now need to affix them to the background piece. First, glue the piece that frames your letters and symbols to the background piece. Affix this frame in the same position it was in when you resawed it from the background earlier.

Now, set the background piece on a bench, with the frame facing up and the edge marked "top" facing away from you. Place all of the cutouts onto the resawn surface in the positions they occupied before being cut out. For

WHAT IF YOUR SCROLLSAW TABLE TILTS ONLY ONE WAY?

Even if your scrollsaw's table doesn't tilt both left and right, you can still make beveled cuts along both sides of a corner with a simple 10° tilted auxiliary table shown *below*. You can fasten this jig to your scrollsaw table with double-faced tape so it tilts to either the left or right. In the photo *below*, we're using this auxiliary table to complete the cuts made in the photo *above*.

No matter what scrollsaw you use, this simple 10° auxiliary table helps you make beveled cuts in any direction.



Nn Oo Pp Qq

help, use a copy of the pattern as a guide. If the stock has visible grain lines, use these to help you position the figures, too.

Next, hold down each character with a nail set and mark its place with an X-acto knife as shown in the photo on *page 40*. Use the same knife to individually lift each character off the background so that you can apply glue as shown *right*. We prefer gap-filling instant glues or epoxies. Use a slow-set epoxy for outdoor signs, and avoid excessive squeezeout around the base of the characters when you set them in position.

To bring out the natural beauty in these signs, we applied a coat of Watco Natural Danish Oil Finish. For outdoor signs, apply a protectant finish such as Thompson's Water Seal. No matter what finish you choose, apply equal amounts to the front *and* back of the sign to reduce warpage.

Buying Guide:

- **Graphic Source Clip Art Library.** Suggested price of $5.95 per book (60 titles currently) at art-supply stores nationwide. For more information contact Graphic Products Corporation, 1480 S. Wolf Rd., Wheeling, IL 60090. Call 708/537-9300.

When applying adhesive, use an X-acto knife to pick your characters off the resawn surface. Orient the knife blade with the grain to avoid marring the workpiece.

Here's what happens if you reverse the pattern

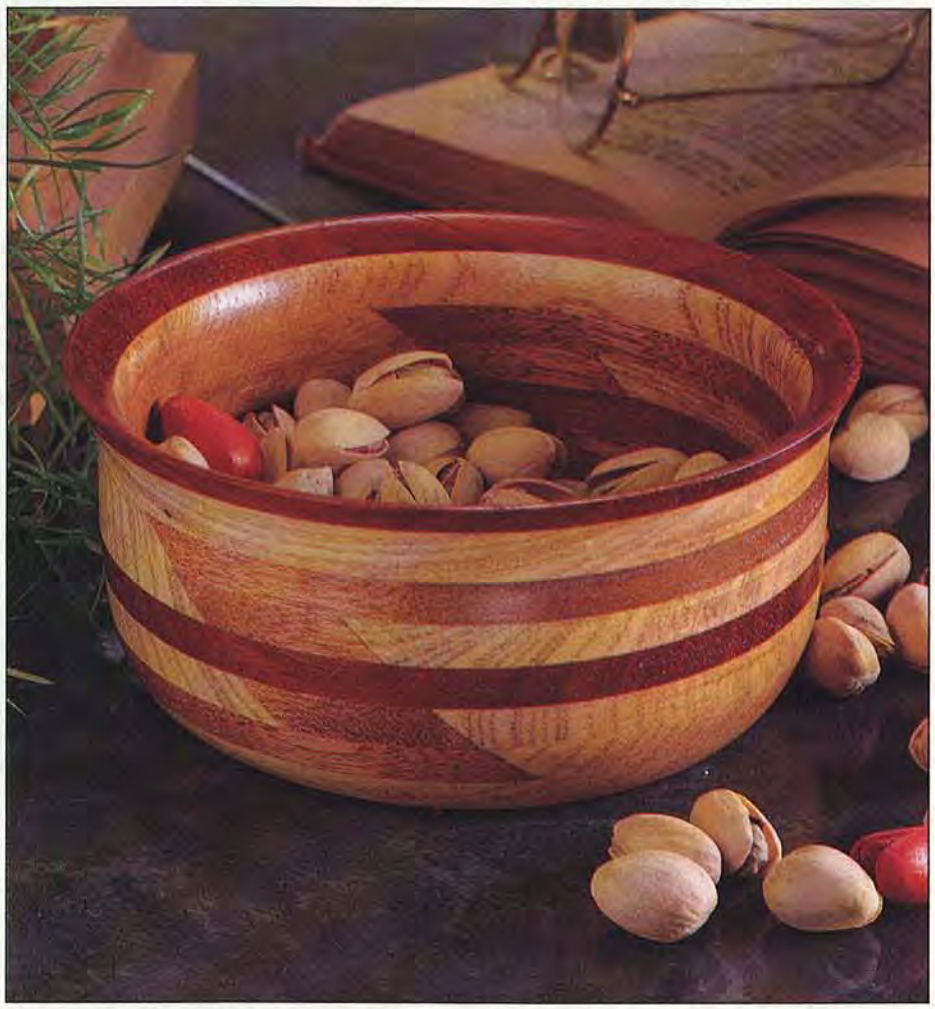
For a different look altogether, you may want to try cutting away the characters in your sign and leaving the background, as shown *right*. If you prefer this sign style, leave your scrollsaw table at 90° to the blade. We found that tilting the table yielded no noticeable visual effect.

Written by Bill Krier with Jim Downing Technical consultant: Rick Hutcheson
Photographs: Hopkins Associates; Perry Struse Illustrations: Kim Downing

LAMINATION

FOR A STRIKING BOWL,

This bowl won't be the quickest lathe project you've ever done, but it may very well be one of the most eye-catching. Start with a 14-piece blank laminated from three different kinds of wood. We'll show you how to build some jigs to make the job easy and guarantee your success.



We used the following tools and supplies:

Stock
See the Bill of Materials

Lathe tools
3" to 4" faceplate with wooden auxiliary faceplate, ½" bowl gouge, ½" round-nose scraper, parting tool

Lathe speeds
Roughing: 500–800 rpm
Finishing and sanding: 1,200–1,500 rpm

Build a jig to saw the bevels

Before cutting the parts, plane the ¼" ash and mahogany to uniform thickness. Variations in thickness between these two woods can spoil your lamination.

Next, rip your stock to 6", and then crosscut Parts A and B to 6". Trim stock for Parts C, D, and E to about ½" longer than shown in the Bill of Materials. Mark each piece with its letter. Saw the mahogany board into two 6½" lengths for Parts F and G.

Parts C, D, E, and F are beveled 45° on one end and Part G on both ends. To cut the bevels on the short, thin pieces safely and accurately, use a sliding auxiliary table on your tablesaw.

To build one, start with a piece of ¾" particleboard or plywood about 16×24" for the platform. Cut two strips of hardwood that fit into the miter-gauge slots on your tablesaw (⅜×¾×16" fit our saw). Glue and screw these runners to the platform bottom, centering the platform's long dimension on the blade. Cut two pieces of 1×4 stock (actual dimensions ¾×3½") 24" long for the front and back fences.

Tilt the saw blade to 45°. Set the platform runners in the grooves, and cut about ¾ of the way across the platform. Using a framing square, position one of the 1×4 pieces on edge at the back of the platform and perpendicular to the blade kerf line. See the Sliding Table drawing.

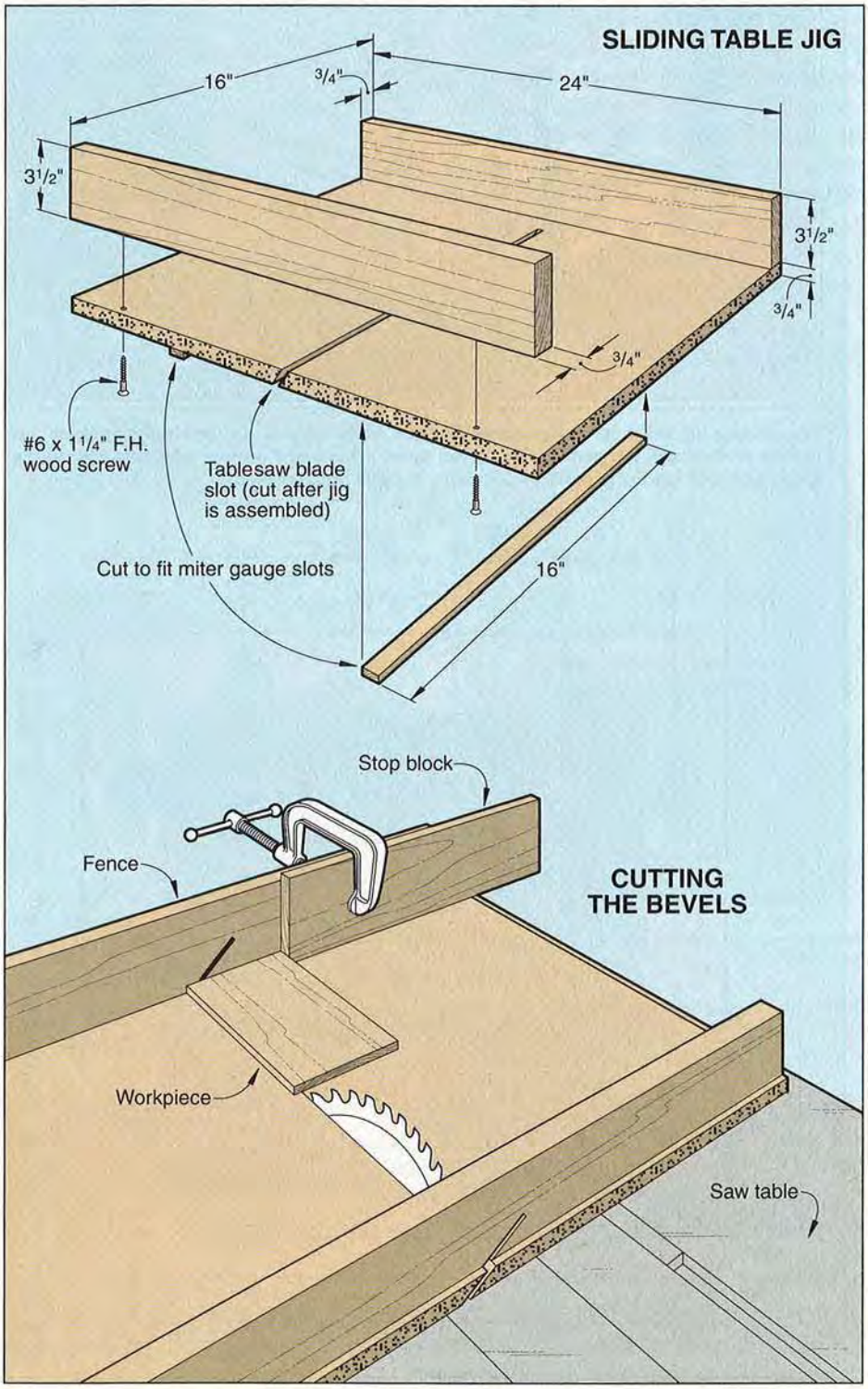
Fasten this back fence with glue and #6×1¼" flathead wood screws from the bottom, countersunk. Glue and screw the other fence at the front. Don't place any screws in the saw blade's path.

With the saw still tilted to 45°, cut all the way across the sliding

Print this article

SENSATION

STACK A STYLISH BLANK



table, kerfing the front and back fences. Wax the runners for smooth operation.

Cut parts for the layers

Mark the length on one Part C blank. Align the mark with the upper edge of the kerf in the sliding table's back fence, shown in Cutting the Bevels, *left*. Clamp a stopblock to the fence.

To speed things up a bit, bevel Part D at the same time as Part C. Just stack a Part D blank atop one for Part C, align both with the stopblock, and cut them. Saw the other C and D, and then measure, mark, and bevel each Part E.

To cut Parts G, bevel one end of each mahogany piece, using the stopblock to ensure equal lengths. Next, draw a mark 1¼" (*not* 1½") from the beveled edge on the long side of the stock.

Align this mark on the *lower* edge of the back-fence kerf, and cut. After you make this cut, Part G should measure 1½" from point to point. Cut the other Part G the same way, and then set the stopblock to cut Parts F.

Let's see how it stacks up

Build the lamination easily by taking a few minutes to make the jig shown on *page 48* first. On a piece of ¾×8×8" particleboard or plywood, mark centers for ¾" holes where shown. Drill the holes ½" deep with a drill press.

Glue a 3–3½" length of ¾" dowel into each hole, setting each perpendicular to the base. After the glue dries, wrap each dowel with plastic food wrap, and lay another piece on the base. Also, wrap some around several pieces of scrapwood about 1×1×6" to use as clamping bars.

Continued

Assemble the lamination upside down in the numerical order, shown on the *opposite page.*

Place one Part A facedown in the lamination jig to begin. Coat the top surface with glue (we used an old credit card as a spreader). Place Part B (layer no. 2) into the jig, and apply glue to it. Then, lay Part F on the right side of the lamination, with the long side down. Spread some glue on the beveled edge of Part C, and match it up to Part F.

Clamp the three layers, ensuring that the joint between Parts C and F remains tight and flush. If necessary, wedge small shims or toothpicks between the dowels and the edge of the layer to keep the joint closed.

Allow the glue to dry, and remove the clamps. Scrape away any dried glue squeeze-out on the face of layer no. 3. Lay Parts D, E, and G in position for layer no. 4, checking the line of the angle on both sides. Adjust as needed, and then remove them and spread glue on layer no. 3.

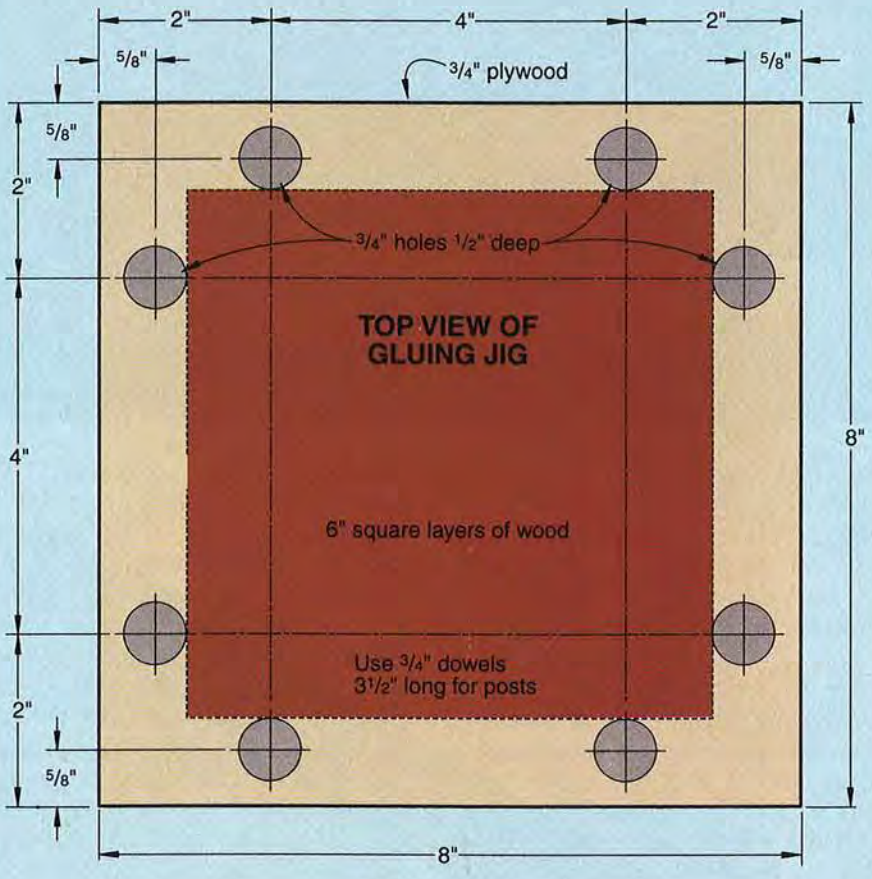
Place Parts D, E, and G on the glued surface. Apply glue for the next layer, and put the remaining Part A onto the lamination. Clamp, ensuring that the angled design doesn't slip out of alignment as you tighten the clamps. After the glue dries, build layers no. 6 and no. 7, and clamp. Do not add layer no. 8 yet.

Saw a hole, make a bowl

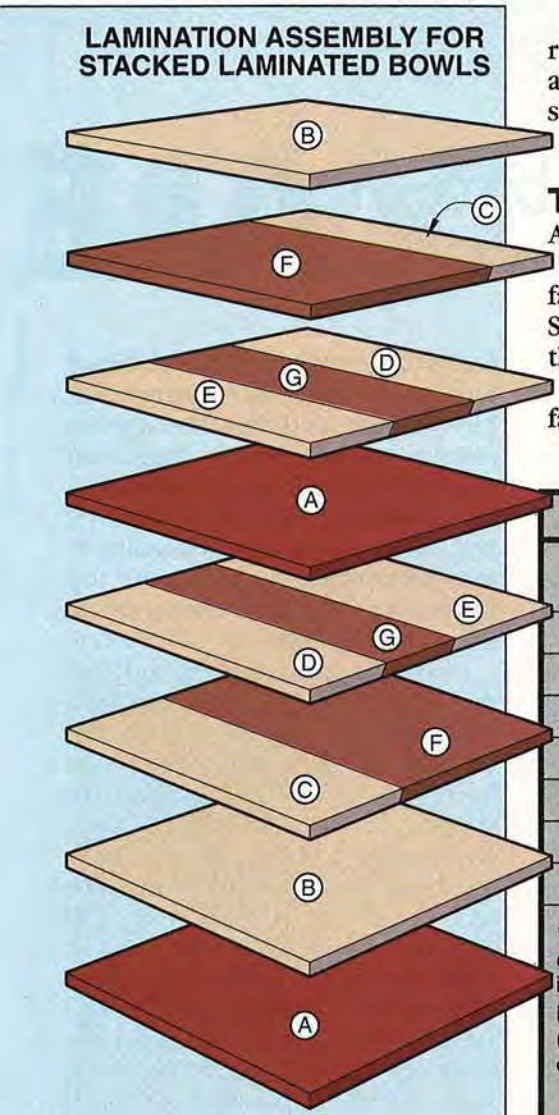
Draw diagonal lines on one face of the lamination to locate the center. Scribe the largest circle around the center that will fit the blank. Then draw a concentric circle 1½" inside the other.

Bandsaw around the outside line. Drill a ¼" blade start hole inside the smaller circle, and cut around that line with your thickest scrollsaw blade to cut the center from the blank. This will save turning time later.

The gluing jig helps keep the edges aligned as you build the lamination. Make sure the jig posts stand perpendicular to the base. A plywood square and scrapwood bars distribute the clamp pressure to ensure a tight lamination.



LAMINATION SENSATION



Place the sawed blank on the remaining Part B, and trace around the outside edge. Bandsaw along the line, and glue the piece to the bottom of the blank.

Take a turn at the lathe

Attach an auxiliary faceplate of ¾" scrapwood to your 3–4" lathe faceplate, and turn the face true. Scribe a centered circle the size of the faceplate on the bottom of the bowl blank. Glue the auxiliary faceplate inside the circle.

Bill of Materials

Layer	Finished Size T	W	L	Matl.	Qty.
A 1, 5	¼"	6"	6"	C	2
B 2, 8	⅜"	6"	6"	A	2
C* 3, 7	¼"	6"	2"	A	2
D* 4, 6	¼"	6"	2¼"	A	2
E* 4, 6	¼"	6"	2¾"	A	2
F* 3, 7	¼"	6"	4¼"	M	2
G* 4, 6	¼"	6"	1½"	M	2

*Initially cut these parts oversized. Then, trim each to finished size according to the how-to instructions.

Material Key: C-cardinal, A-ash, M-mahogany

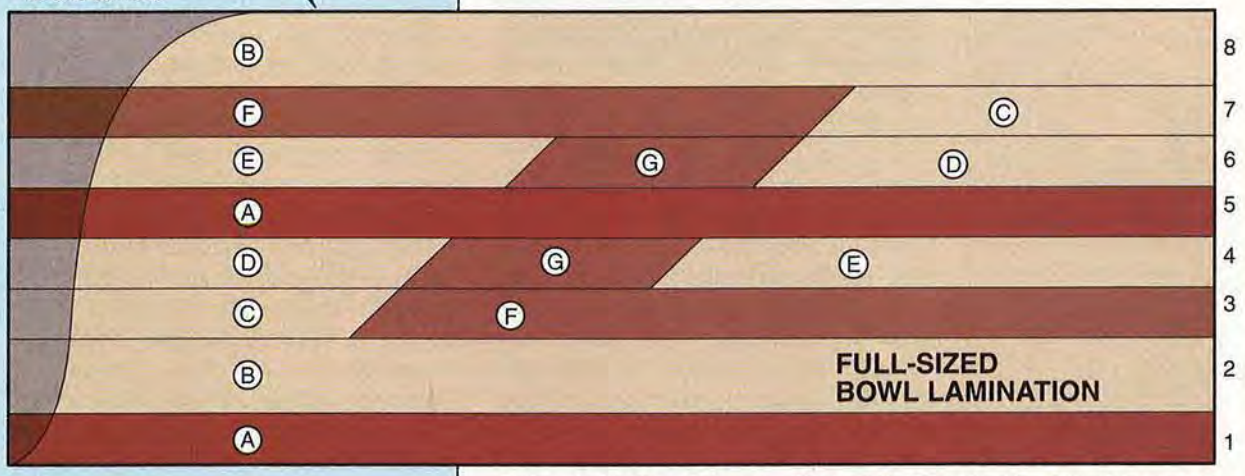
(We first cut our stock to these sizes to make one bowl:
Ash, ⅜×6×13" and ¼×6×17"
Mahogany, ¼×6×13"
Cardinal, ¼×6×13")

(We used yellow woodworker's glue, and clamped the assembly overnight.) Mount the faceplate and blank on your lathe.

With your ½" bowl gouge, turn the outside of the bowl to the profile shown. (Trace the profile onto thin cardboard and cut it out if you'd like a template.) The three woods have different cutting characteristics, so take light cuts for the best results. And, of course, be sure to keep your tools sharp to prevent tear-out.

Reposition the tool rest, and use the same gouge on the inside of the bowl. Turn the bowl to a uniform wall thickness of 3⁄16–¼", checking with your calipers as you work. Remove any waves or ripples with the scraper, and then sand with progressively finer grits from 100 to 400. Sand away any circular sanding marks that remain in the bottom of the bowl.

Finish the bowl with a clear oil or similar. (We used Minwax Woodsheen natural rubbing oil). After the finish dries, part the bowl from the lathe, angling the point of the parting tool a few degrees toward the top of the bowl to create a slightly dished base. This will prevent the finished bowl from rocking when it's placed on a flat surface. Sand the bottom, sign and date your work, and finish the bottom.



Project Design: Larry Johnston Photographs: Wm. Hopkins; John Hetherington
Illustrations: Mike Henry, Kim Downing

A bird-in-the-hand ALE

Print this article

More than a thousand years ago, Vikings drank ale from wooden bowls carved to look like birds. Now, you can carve one. Even if you use it only for a decoration, it will still quench your thirst for a fun carving project.

WE USED THESE TOOLS AND SUPPLIES

Stock

Basswood or other carving wood 4×5×10". See the Buying Guide *below* for a precarved roughout.

Tools

Different sizes and styles often will work in place of tools listed.

Gouges

No. 3, ⅝", 1"
No. 5, ½"
No. 5 spoon, ⅝"
No. 7, ¾"

Skew ⅝"

V-Tool ¼" no. 41 (45°)

Knives

Bench knife
Chip-carving knife

Other

Drill or drill press with ⅞" Forstner bit, scorp

Finishing supplies

Danish oil

Buying guide

Roughout. Basswood roughout, $9.90 ppd. in U.S., order from Ozark Mountain Crafts, Box R, Branson, MO 65616

Bird-shaped wooden drinking bowls—variously called ale hens, ale geese, or just ale bowls—date back 1,000 years to the Viking days. Later, they appeared throughout Scandinavia and Russia.

The bowls fell into two groups, which we'll call *table* birds and *swimming* birds. A table bird, with its flat bottom, could be set down between swigs. Swimming birds floated in ale vats for use as dippers to refill the table hens or as communal cups.

While the ale hens were everyday items (ale was a common beverage, with and without meals), many featured ornate carving. Elaborately painted ale hens gained popularity in the 18th century. By the middle of the next century, though, cups of coffee displaced bowls of ale as the beverage of choice, and the fanciful carved bowls were shelved or discarded.

Today, carved ale hens often serve as ornamental bowls for nuts and candy or small potted plants. But hardly anybody drinks ale from them anymore.

Phillip Odden of Baronet, Wisconsin, carved the Russian-influence ale hens shown—one plain and one fancy—to demonstrate the range of styles. We'll tell you how to carve the plain one. Feel free to dress it up with the classic acanthus leaf pattern, as Phil did, or some other favorite motif. You could even paint yours.

(**Roughout users,** *skip to* Move ahead with a handle.)

Let's dive right into the bowl

Enlarge the patterns on *page 82* at 125 percent, and then transfer the *red* top and side profile lines onto a 4×5×10" piece of basswood. Bandsaw the side pattern line, and then tape the waste back to the workpiece. Cut along the top pattern line. Draw a centerline the length of the top.

Draw the *blue* oval on top and the *purple* footprint on the bottom, and then begin carving the outside of the bowl with your bench knife. (You also could shape the outside of the bowl with gouges and a skew.) Bow the bowl sides slightly from the *blue* top line to a wide point (4" across) about halfway down. From there, curve the sides under to meet the footprint line.

Create smooth junctions where the neck and tail meet the bowl. Carve away all bandsaw marks.

Drill an ale well

Rough out the inside of the bowl efficiently with a ⅞" Forstner bit and a drill press. First, sketch the *green* lines onto the carving. Then, grip the workpiece with a handscrew clamp, and bore overlapping holes 1½" deep inside the smaller *green* oval.

Rough the inside bowl wall with a ¾" no. 7 gouge. (If you have a scorp, this is a good time to use it.) Slope the wall from the outer *green* oval at the top to the bottom established by drilling.

(For ornamental carving on the sides, leave the opening smaller and the walls thicker.)

Project Design: © Phillip Odden Photographs: John Hetherington; Wm. Hopkins

BOWL

Clean up the interior bottom with a spoon-bent gouge as shown *below*—a ⅝" no. 5 would be a good choice. Aim for a side-wall thickness of about ⅜" as you smooth the interior, including the transition to the bowl bottom. But don't hide the fact that this is a hand-carved piece; leave some texture marks from the tools.

A spoon-bent gouge comes in handy for carving the inside of the ale bowl. Remove drill-bit marks as you surface the bottom of the bowl.

Move ahead with a handle

(Roughout users, *skip this paragraph and the next one.*)
Draw the *purple* lines onto both sides of the head. Divide the width of the head into four equal sections by drawing a line halfway between the centerline and the edge on each side.

With your knife or a gouge, cut away the outside quarter on each side of the comb. Redraw the lines on the side of the comb. Carve the beak to the same width from the tip to about ½" back, and then taper it to the head.

Carve and round over the front and back corners of the head to the contour line, *below*. With the knife or a V-tool, separate the three segments of the comb along the lines. Carve a slight hollow inside the areas marked in *orange* on the comb.

Round the top corners of the beak, bringing the end to a point. Work toward the centerline as you carve; it will help you keep the beak symmetrical. Join the top of the beak to the top of the head with a smooth, unbroken curve.

Lines divide the head into quarters. Here, the outside quarters have been cut away near the beak end and comb as we round the front corner of the head.

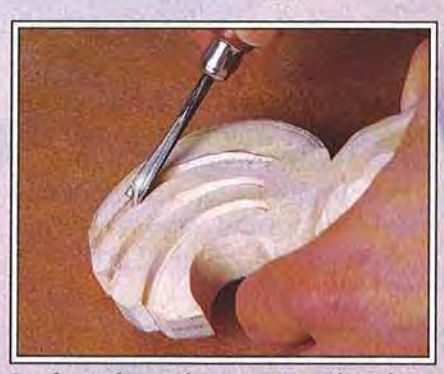
Carve the beak line on each side with a V-tool. With your knife, make four triangles inside a circle for each eye. Aim the knife tip to the inside of the triangle as you slice along each straight side. Release the triangular chip by cutting along the curved line.

Fashion the tail feathers

Draw the *purple* lines onto both sides of the tail. Then, with a ¼" 45° V-tool, stop-cut each line about ⅛" deep. (*Stop cut:* an incision along a pattern line enabling you to carve to the line without chipping out wood beyond it.) Hold the V-tool with the side nearest the line perpendicular to the tail surface, as shown *below*.

Taper the sides of the four tail feathers thus formed, paring down the upper portion of each about 1/16" with a ⅝" skew chisel. This gives the tail a sawtooth cross-section. Carve the *orange* tail detail lines with a V-tool.

Texture the body with a shallow gouge, such as a no. 3. Decorate the sides with the two V-tool lines shown in *orange*.

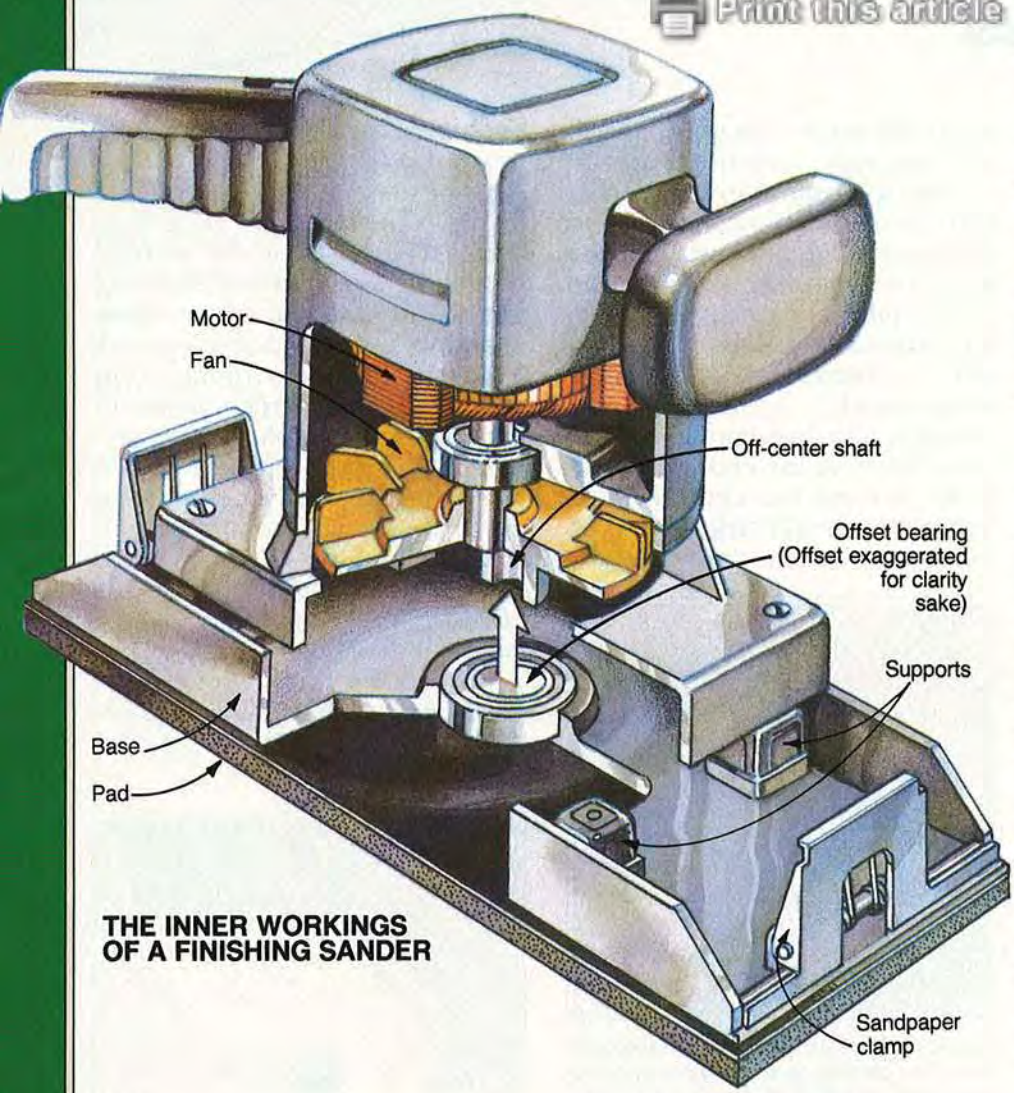


Surface the tail to remove bandsaw marks before you separate the tail feathers with V-tool cuts. Carve the tail feathers thinner at the top.

Stain the ale hen (that's golden oak on ours), and then sand it lightly to raise some highlights. Sign and date your creation on the bottom, and then apply two coats of Danish oil finish.

FINISHING
A SMART-SHOPPER'S

Print this article



THE INNER WORKINGS OF A FINISHING SANDER

Most of us welcome anything into our shops that makes sanding easier. No wonder that finishing sanders, also known as orbital sanders, have become so popular with woodworkers far and wide. One big reason: These machines give you the control of hand-sanding, but without the blisters, perspiration, or sore fingers.

Manufacturers have met the high demand for finishing sanders with a dizzying array of products in three different sizes. Based on a 9×11″ sheet of sandpaper, these machines hold either a ½ sheet, ⅓ sheet, or ¼ sheet of abrasive. To guide you through this assortment, we tested 29 machines priced from $38 to $500. The following results will help you buy a model that fits both your needs and budget.

How finishing sanders smooth the way for you

Regardless of the size of a machine, all finishing sanders work in a similar way. As shown *left*, an

Porter-Cable 505 | AEG VSSE280 | Makita 9045N | Milwaukee 6014 | Bosch 1290D

½-SHEET FINISHING SANDERS

SANDERS
GUIDE TO 29 MODELS

off-center shaft located below the fan holds a bearing that spins in an eccentric orbit. This rapid orbital action moves the abrasive grains in tiny circles (typically 1/16" to 1/8" in diameter).

To reduce vibration, manufacturers counterbalance the fan and rest the motor housing on plastic or rubber supports on the machine's base. A pad that's glued or screwed onto the base provides a backing surface for sandpaper.

Sizing up the machines: How much sander do you need?

Since ½- and ¼-sheet sanders have the greatest share of today's finishing-sander market, we'll fill you in on those first, and then we'll move on to the less-popular ⅓-sheet sanders. Here's a look at each type:

- **½-sheet sanders:** These large tools have one primary advantage over the smaller machines—speed. Because their pads have more surface area, ½-sheet models help you finish-sand large surfaces such as tabletops in as little time as possible. On the other hand, their size and weight make them awkward for sanding in tight spots, such as inside small drawers or cabinets. And, as you can see in the chart on *page 57*, some models do not sand flush against walls or into corners because their sandpaper clamps or dust-collection shrouds extend past the base of the machine.
- **¼-sheet sanders:** Despite their small size, these tiny tikes can pay some big dividends in your workshop. All of them will reach into tight spots, and most of them help you sand flush against walls and into corners with ease. They're also light (4 pounds tops), so they won't fatigue your hand when sanding vertical surfaces. And, they're inexpensive (less than $60 through discount merchandisers).
- **⅓-sheet sanders:** These machines don't cover as much ground as the ½-sheet sanders, and they don't get into tight spots the way that ¼-sheet sanders do. But, they offer a compromise between these two extremes that may suit your needs if your budget allows you to own only one finishing sander.

Handling comfort: Look for a low-vibration machine

All 29 machines in our test had comfortable handles and sanded reasonably well. But, what truly separated them into high-quality and low-quality categories was their level of vibration.

In the chart on *page 57*, we give the sanders *excellent, good, fair,* or *poor* ratings in this area. Look for a machine with *excellent* or *good* ratings if you use a finishing sander for extended periods of time on a regular basis. If you're an infrequent user, you should be able to get by with sanders having a *fair* rating.

Only two sanders in our test—the Sears ½- and ⅓-sheet models—received *poor* ratings in the vibration category. These sanders were the only dual-motion machines in the bunch. This means that their pads move in either an orbital or straightline (back and forth) motion. Because of the additional gearing and motion-changing mechanisms required for these sanders, they vibrated more, and sounded a lot noisier, than any other machine tested. Keith Scoggins of Ryobi Motor Products, the company that makes most Craftsman portable electric tools, said that customer demand for the dual-motion feature justifies the additional noise and vibration. We urge you to try one of these sanders before making a purchase to judge for yourself.

Continued

Metabo 4321 | Elu 4015 | Sears 11616 | Ryobi SU6200 | Fein MSS641B | Hitachi SV12SD

FINISHING SANDERS

Spring clamps, such as this one on the Porter-Cable 505, are durable but require a lot of hand pressure to open.

You can easily open lever-assisted spring clamps such as the one shown here on the Milwaukee 6017.

Wire clamps such as those on the DeWalt 411 open and close easily, but aren't as durable as other types.

The Porter-Cable 330 has a detached lever for its spring clamps. It works well—if you don't lose it.

Clamping systems: convenience and durability count

All of the tested finishing sanders—even those that are compatible with sticky-back abrasives—have two clamps for holding sandpaper sheets onto their pads. As shown in the photos *left*, we divided the clamp styles into three types: spring clamps, lever-assisted spring clamps, and wire clamps. Of these, we found the spring clamps the most durable, but some of them—especially those on the Ryobi SU6200 and Skil 7582—took quite a bit of hand pressure to open. The wire clamps proved to be convenient, but some of them seemed a little flimsy, and others had sharp ends that poked us from time to time.

Most of the lever-assisted clamps have a built-in lever that swings out from the clamp to assist you in prying open the clamp. The Porter-Cable 330 was the only tool of this type that had a detached lever as shown *bottom left*. We had a tendency to misplace this lever, so we tethered it to the tool's power cord. A screwdriver works in place of this lever.

Because the clamps varied so much from model to model, even among clamps of the same type, we can't recommend one type of clamp as being better than the others. So, in the chart on *page 57*, we give each machine's clamping system a combined rating for convenience and durability.

What you need to know about bases and pads

The machines in our test had aluminum, stamped steel, or plastic bases. We rate the aluminum bases as the most durable, but the stamped steel or plastic bases should last for many years if you use the tool only occasionally.

Beneath the base sits the pad. Manufacturers either screw or glue the pad to the base, and we prefer the screwed-on variety because they're easier to change.

With the exception of three tested sanders that have felt pads, half of the remaining sanders have foam-rubber pads, and half have hard-rubber pads. The foam-rubber pads conform better to curved surfaces. The hard-rubber pads perform best on flat surfaces, especially on soft-grained woods such as pine, basswood, or butternut. Why? A sander with a hard pad has less tendency to remove uneven amounts of material from areas of hard and soft grain.

The felt pads offer a compromise: They're harder than foam rubber, but not nearly as firm as hard rubber. If you prefer to use pressure-sensitive-adhesive (PSA) abrasives, also known as sticky-back abrasives, keep in mind that all felt pads, as well as some of the rubber pads, do not accept PSA abrasives as noted in the chart on *page 57*. Also note in this chart that some sanders have various pads (hard, soft, or round) as optional accessories in case you don't like the standard pad.

¼-SHEET FINISHING SANDERS

Sears 11602 | Makita BO4550 | Porter-Cable 330 | Milwaukee 6017 | Black & Decker 7441

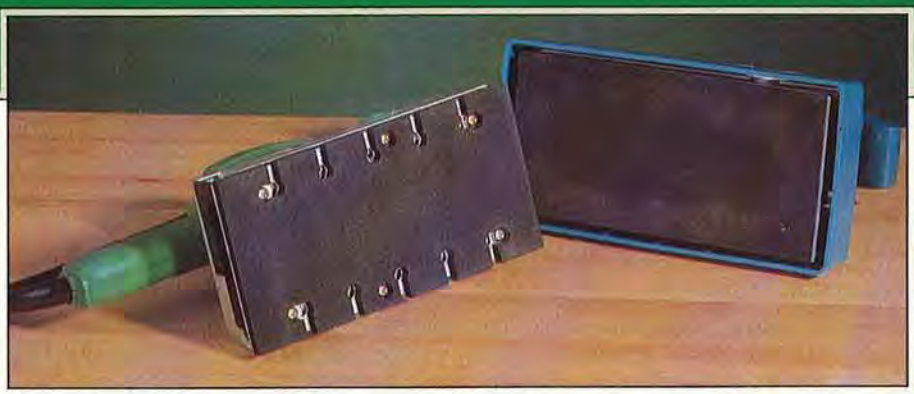
Dust collection: Let's clear the air

Like any sanding machine, finishing sanders generate a lot of superfine dust, the kind that becomes quickly airborne. So we consider dust collection an important feature, especially if you work in a confined space.

Manufacturers build dust collection into finishing sanders in two ways: through holes in the pad or through a shroud that surrounds the perimeter of the pad (see photo *above right*). Both systems have advantages.

The through-the-pad system doesn't interfere with flush or corner sanding, and that's why manufacturers employ them on ¼-sheet sanders. These machines require you to buy pre-punched paper (often at a premuim price), or punch holes in the sandpaper yourself with a supplied or optional punch.

A shroud system collects fine dust more completely than through-the-pad systems because little dust escapes from around the perimeter of the machine. You do have to remove shrouds to change abrasives. However, this normally doesn't take more time than punching holes into the sandpaper and lining them up with holes in the pad as you do with through-the-pad systems. Because shrouds prevent you from sanding flush or into a corner, you'll find this system most often employed on ½-sheet sanders.



The Hitachi SV12SD at left, *above,* has holes in the pad for collecting dust through holes you punch in the sandpaper. The Makita 9045N at right, *above,* has a shroud that collects dust from the perimeter of the pad.

TWO SANDING SPECIALISTS FOR TIGHT SPOTS

If you frequently finish-sand tight areas, you might be interested in either the Fein Triangle Sander or the Ryobi model DS 1000 Detail Sander. Both machines have small, oscillating, triangular pads that reach into tight corners, nooks, and crannies.

The two machines differ substantially in construction, performance, and price. The heavy-duty Fein machine should last a lifetime and sells for about $300. For an extra $45 you can add a dust-collection accessory. The lighter Ryobi unit meets the needs of most hobbyists and sells for less than $60.

The Fein machine has almost no vibration in its handle, and we found it exceptionally easy to control. The Ryobi vibrates quite a bit, so we don't recommend using it for extended periods of time. The Fein sander has the advantage of allowing you to rotate the pad ⅓ turn so you can make use of all three corners of the abrasive disc without removing it from the pad.

The Fein Triangle Sander helps you sand into corners and tight spots with great control and little vibration.

Ryobi's DS 1000 Detail Sander meets the needs of most home hobbyists at a down-to-earth price: about $60.

Continued

Hitachi SV12SA | Skil 7576 | DeWalt DW411 | Bosch 1289D | Ryobi S600

FINISHING SANDERS

Our recommendations

● **½-sheet sanders:** Choosing a top model in this class was no easy task. For all-around value we favor the Bosch 1290D, with the Elu 4015, Milwaukee 6014, and Porter-Cable 505 close on its heels. All of these machines sell for $120–$130, and sand equally well. Only the Bosch comes standard with dust collection, and you'll pay extra for the optional dust shrouds for the P-C and Milwaukee units. Like the P-C, the Elu sander features an impressive aluminum housing, but has no optional dust-collection accessories as the P-C does.

Other sanders to consider include the Fein MSS 641B if you desire only the best and can afford it, and the Metabo 4321. Although the Metabo costs a little more than the Bosch, Elu, Milwaukee, or P-C sanders, it operates 12 decibels quieter than the next-quietest machines.

● **¼-sheet sanders:** The Porter-Cable 330 was the first ¼-sheet sander on the market back in 1965. Today, it still rules the roost. The model 330 does everything well, at the lowest vibration and noise levels of any machine in this class.

However, with a 7½" height the P-C sander is nearly two inches higher than the next-tallest ¼-sheet sander. And, at 4 pounds it weighs a pound more than the next-heaviest machine in this class. Also, the P-C does not have dust-collection. If these considerations make you want to look elsewhere, either the DeWalt DW411 or Milwaukee 6017 should meet your needs.

If you're an occasional user, you can save about $20 by purchasing the Sears 11602—an excellent value at $38. It makes a little more noise than other sanders in this category, but it sands every bit as well.

● **⅓-sheet sanders:** If you can't afford to buy a ½-sheet sander *and* a ¼-sheet sander, the Ryobi S45 may be the compromise you're looking for. Because of its hard-rubber pad it works well on large flat surfaces, but it can't handle contours the way that a ¼-sheet sander with a foam-rubber pad does. Like a ¼-sheet machine, it works well for flush and corner sanding tasks.

Written by Bill Krier
Technical consultant: Bob McFarlin
Photographs: John Hetherington
Illustration: Kim Downing; Jim Stevenson

Manufacturers' listing:

AEG
(Distributed by Atlas Copco)
800/243-0870; 203/447-4600

Black & Decker
800/762-6672; 410/527-7000

Bosch
For the location of your nearest dealer, look under "Tools" in your Yellow Pages.

DeWalt
800/433-9258

Elu
(see Black & Decker listing)

Fein
800/441-9878; 412/331-2325

Hitachi
800/829-4752; 404/925-1774

Makita
714/522-8088

Metabo
215/436-5900

Milwaukee
414/781-3600

Porter-Cable
901/668-8600

Ryobi
800/525-2579; 803/226-6511

Sears
Call or visit your local Sears store or telecatalog center.

Skil
312/286-7330

29 FINISHING SANDERS: TAKE YOUR PICK

	Manufacturer/ Importer	Model	Clamp Type (1)	Type (2)	Pad: Attachment (3)	Pad: PSA Compatible (Y, N) (4)	Base Type (5)	Orbits Per Minute	Amps	Dust Collection (6)	Performance Evaluation (7): Clamps (8)	Dust Collection (9)	Vibration	Flush Sanding (10)	Corner Sanding (10)	Twist (11)	Noise Level (12)	Overall Performance Rating (13)	Overall Value Rating (14)	Accessories (15): Standard	Accessories (15): Optional	Cord Length	Height	Weight (Pounds)	Country of Assembly (16)	List Price	Selling Price (17)
1/2-Sheet Sanders	AEG	VSSE280	W	FR	S	N	A	0-10,000	2.1	B, TP	G	E	F	G	G	G	82	6	6	DB	PP	10'	8 1/2"	4.1	G	$235	$165
	BOSCH	1290D	L	HR	S	N	A	10,000	4.6	B, SH	E	E	G	P	P	G	85	9	9	DB, DS	VA, VH	6'6"	8"	6.2	S	209	125
	ELU	4015	S	FR	S	N	A	10,000	3	NONE	F	NONE	E	E	P	E	84.5	8	8			8'	7"	7.8	M	208	130
	FEIN	MSS641B	L	HR	S	Y	A	20,000	4.8	TP, V	E	E	E	G	E	G	84	10	5	VA	DB, VP	9'4"	8"	7	G	580	500
	HITACHI	SV12SD	L	FR	S	N	A	10,000	2.8	B, TP	E	E	G	G	F	G	76	7	7	DB	PP, VA, VP	8'	7 1/4"	6.2	J	218	130
	MAKITA	9045N	L	FR	G	N	A	10,000	4	B, SH	G	G#	G	E	P	G	91.5	7	7	DB, DS		8'9"	6 1/4"	6.2	J	246	130
	METABO	4321	S	HR	S	N	A	22,000	1.8	NONE	E	NONE	E	P	P	F	64	8	6		CC	8'6"	7"	4.1	G	219	175
	MILWAUKEE	6014	S	FR	S	Y	A	12,000	5	B, SH	F	G#	E	G	G	E	85.5	9	8	DB	CC, DS	7'10"	7"	7	U	214	120
	PORTER-CABLE	505	S	FR	S	Y	A	10,000	2.3	SH, V	F	G#	E	G	E	E	76	9	8		DS, VH	7'2"	6 3/4"	7.4	U	210	120
	RYOBI	SU6200	S	FR	S	Y	A	10,000	2.9	NONE	P	NONE	G	E	E	G	81.5	7	7			6'6"	8"	7.9	J	227	130
	SEARS	11616	L	HR	G	Y	S	4,000	4	B, SH	G	F#	P	F	F	P	94.5	5	7	DB, DS	CC	10'	7 3/8"	5	U	78	78
1/3-Sheet Sanders	BLACK & DECKER	7454	W	FR	G	N	P	6,500-11,000	1.2	TP, V	G	F@	F	G	G	F	83.5	6	8	PP		6'2"	5 3/4"	2.1	E	100	55
	MAKITA	9035	L	FR	G	N	S	10,000	1.7	NONE	G	NONE	F	F	F	G	82	6	7			6'10"	5 3/4"	3	J	118	75
		9036	S	FR	S	N	A	12,000	2.2	TP, V	E	G	G	F	P	F	82	8	8	DB	PP, VH	6'10"	6"	3.1	J	125	80
	METABO	SR282	S	HR	S	N	A	22,000	2.6	B, TP	E	E	E	P	P	F	68	9	7	DB	CC, PP	8'6"	7 1/2"	5	G	209	165
	RYOBI	S45	L	HR	G	N	S	10,000	2.1	DB, TP	G	E	G	E	E	G	83.5	9	9	PP		6'	6 3/4"	4.4	U	118	70
	SEARS	11613	L	HR	G	N	S	4,000	3	B, SH	G	F#	P	F	F	P	93.5	4	8	DB	CC	6'	7"	4	U	60	60
	SKIL	7582	S	F	G	N	A	10,000	2	NONE	P	NONE	G	P	P	G	84	5	6		CC	7'10"	7"	4.8	U	127	85
		7382	L	FR	G	N	P	10,000	1.6	B, SH	G	F#	G	G	G	F	80	6	8	DB, DS	CC	5'	6 1/2"	3.8	N	73	65
1/4-Sheet Sanders	BLACK & DECKER	7441	W	F	G	N	P	15,000	1.6	NONE	F	NONE	G	E	E	F	84	8	8			6'3"	5 1/4"	2	U	59	35
	BOSCH	1289D	S	HR	S	N	A	10,000	1.35	B, TP	G	G	E	G	G	P	82	7	8	DB, PP	VA, VH	6'6"	5 1/4"	3	S	98	60
	DeWALT	DW411	W	FR	S	N	P	13,500	1.7	B, TP	G	E	E	E	E	G	83	9	9	DB, PP	VA, VP	8'	5 1/4"	2.6	U	87	60
	HITACHI	SV12SA	W	HR	S	N	A	12,000	1.7	NONE	G	NONE	G	E	E	G	86.5	8	9		VP	8'4"	5 1/2"	2.8	J	88	50
	MAKITA	BO4550	L	FR	G	N	P	14,000	1.6	B, TP	F	E	G	P	P	F	84.5	6	7	DB, PP	VP	6'	5"	2.1	J	93	55
	MILWAUKEE	6017	L	FR	G	N	P	13,000	1.8	B, TP	G	E	G	E	E	E	86.5	9	9	DB, PP		9'	5 1/4"	2.4	T	97	60
	PORTER-CABLE	330	L	FR	S	Y	A	14,000	1.2	NONE	G	NONE	E	E	E	E	76	10	9		VP	7'	7 1/2"	4	U	103	60
	RYOBI	S600	L	F	G	N	A	12,000	1.8	NONE	G	NONE	E	F	F	G	84	7	8			6'6"	5 1/2"	2.6	U	101	60
	SEARS	11602	L	HR	G	Y	S	14,000	2	NONE	G	NONE	G	E	E	G	87.5	8	9			8'4"	5"	2.6	U	38	38
	SKIL	7576	L	FR	S	Y	P	13,000	1.7	B, TP	F	G	G	G	G	G	82.5	7	8	DB, PP	DD	8'	5 3/4"	2.8	U	78	55

NOTES:

1. (L) Lever-assisted spring clamps
   (S) Spring clamps
   (W) Wire clamps
2. (F) Felt
   (FR) Foam rubber
   (HR) Hard rubber
3. (G) Glued to base
   (S) Screwed to base
4. Compatibility of pad with pressure-sensitive-adhesive-backed abrasives. Yes or No.
5. (A) Aluminum
   (P) Plastic
   (S) Stamped steel
6. (B) Bag
   (DB) Dust box
   (S) Shroud
   (TP) Through the pad
   (V) Vacuum
7. E Excellent
   G Good
   F Fair
   P Poor
8. Rating based on convenience of opening and durability.
9. (#) Rating lowered one grade because shroud was relatively difficult to install and remove.
   (@) Rating lowered two grades because system only works when you hook up machine to vacuum.
10. E Sides of sander do not hammer walls adjoining the machine.
    G Slight hammering present.
    F Hammering present, but sanding is still possible.
    P Due to excessive hammering or machine interference, you cannot sand flush or into a corner.
11. Tendency of the machine to twist and spin as you move it across a surface.
12. Measured in decibels from a distance of three feet.
13. Machines rated on a 1 to 10 scale based on overall performance.
14. Machines rated on a 1 to 10 scale based on value, taking performance and price into consideration.
15. (CC) Carrying case
    (DD) Disposable dust bags
    (DS) Dust shroud
    (PP) Punching plate for sandpaper
    (VA) Vacuum attachment
    (VH) Vacuum hose
    (VP) Various pads
16. (E) England
    (G) Germany
    (J) Japan
    (M) Mexico
    (N) Netherlands
    (S) Switzerland
    (T) Taiwan
    (U) United States
17. Selling prices based on lowest prices from mass merchandisers and catalog sources at time of article's production. Prices at full-service dealers may be higher.

A CREDENZA WITH CHARISMA

Beauty runs deep in this roomy showcase

Print this article

During my career as a woodworker, I've built lots of display cases. So when I got the opportunity to design one especially for *WOOD*® magazine readers, I jumped at the chance. Here's hoping you like what you see. I'm particularly pleased with the mirrored back, which allows you to view your collectibles from all sides. This same design element also captures enough existing light to make wired cabinet lighting unnecessary. You can choose either a mirrored top or a handsome walnut one, too.

Well, now that I've done my part, it's your turn. Enjoy!

Jim Ballenger
Project Builder

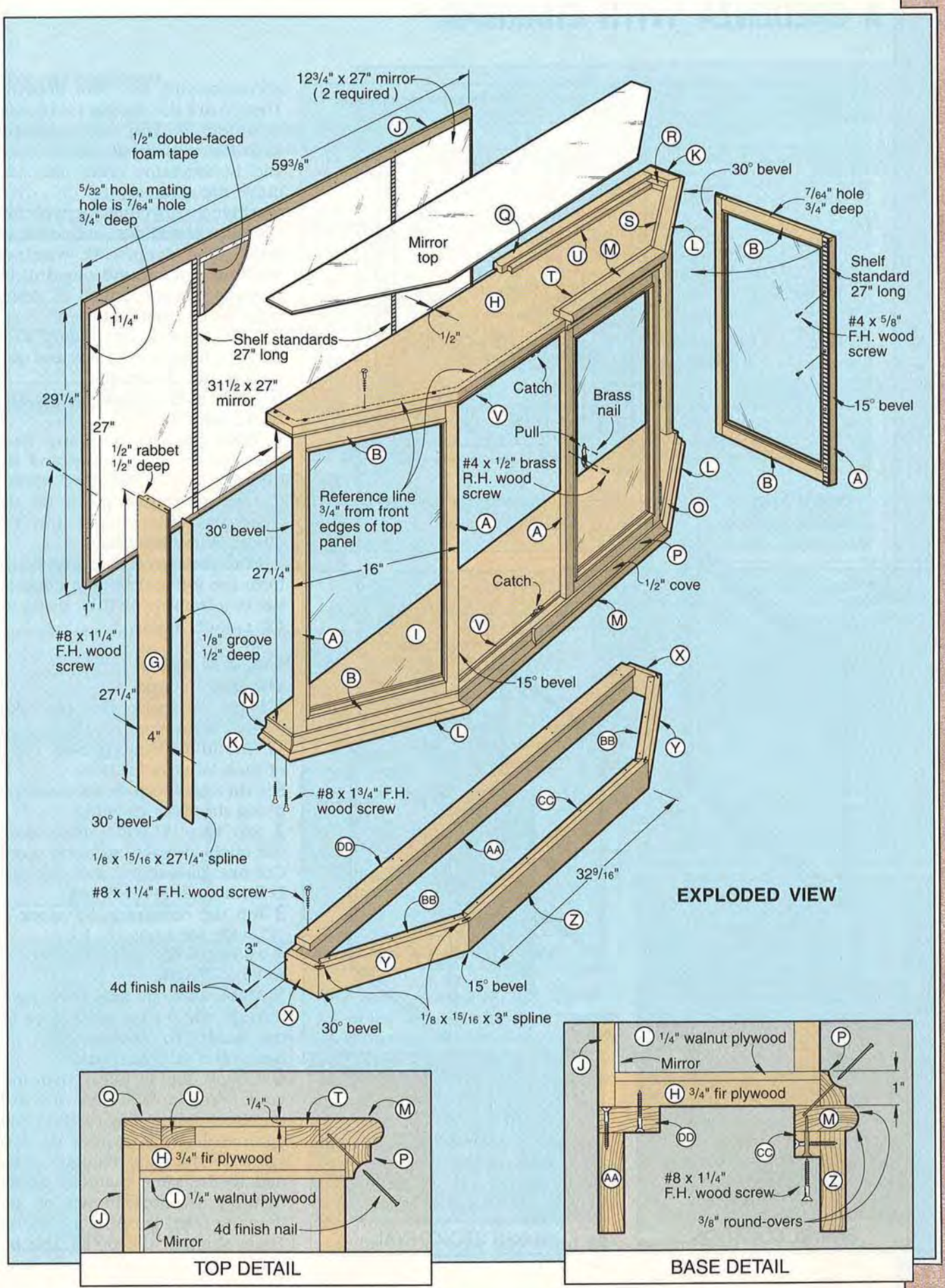
Build the side and door frames first

Note: *To minimize cutting different lengths of stiles and rails and to simplify the construction process, build four identical frames (A, B). You'll use two for the angled side frames and two trimmed versions for the doors.*

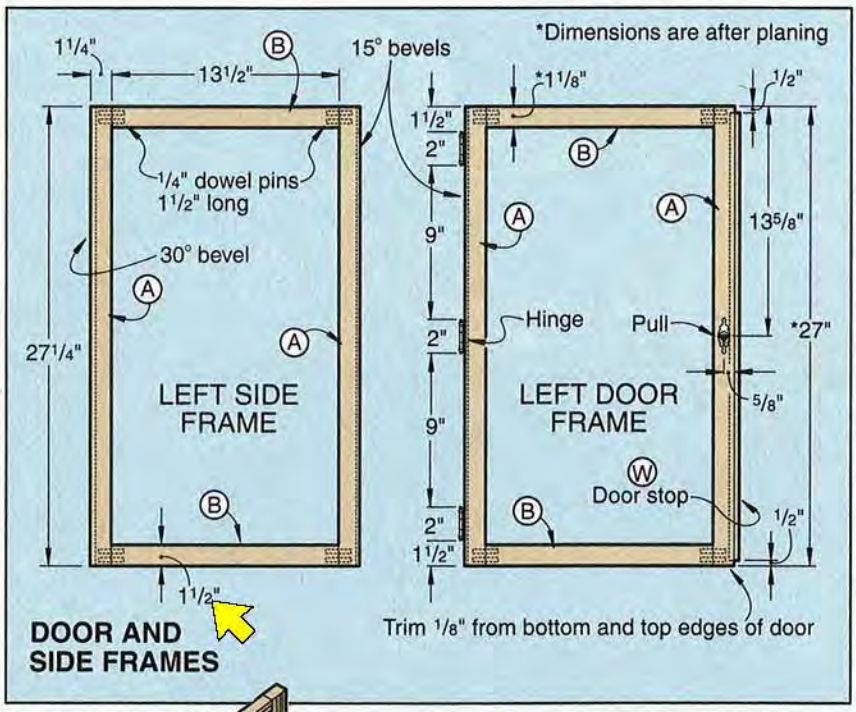
1 Rip and crosscut the frame stiles (A) and rails (B) to the sizes stated in the Bill of Materials.

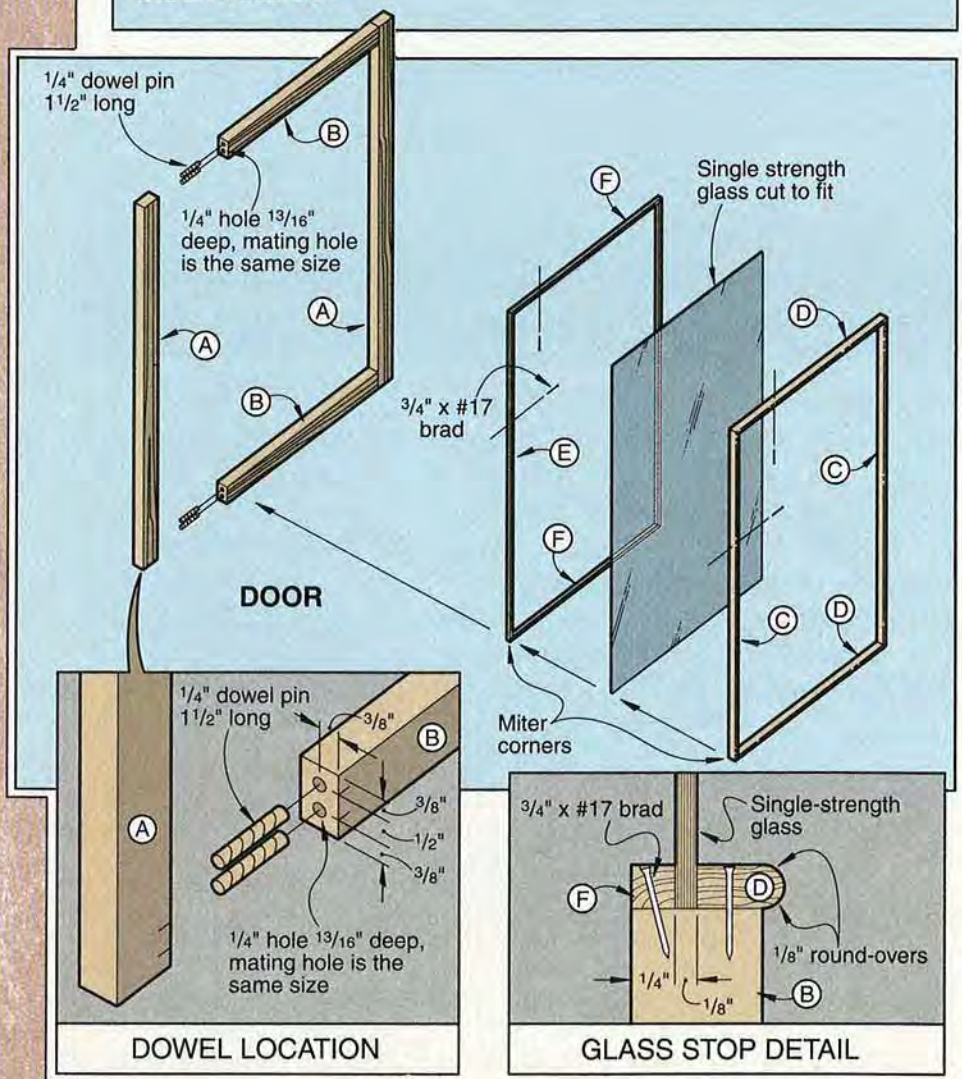
2 Dry-clamp (don't glue) the stiles and rails for each of the four frames. Using a square, carefully make the dowel-hole alignment marks (centerlines) where dimensioned on the Dowel detail

Text continued on page 60


12 3/4" x 27" mirror
(2 required)
1/2" double-faced foam tape
59 3/8"
5/32" hole, mating hole is 7/64" hole 3/4" deep
Mirror top
30° bevel
7/64" hole 3/4" deep
Shelf standard 27" long
#4 x 5/8" F.H. wood screw
15° bevel
1 1/4"
Shelf standards 27" long
1/2"
29 1/4"
31 1/2 x 27" mirror
Catch
Brass nail
Pull
27"
1/2" rabbet 1/2" deep
#4 x 1/2" brass R.H. wood screw
Reference line 3/4" from front edges of top panel
30° bevel
27 1/4"
16"
Catch
1/2" cove
1"
#8 x 1 1/4" F.H. wood screw
1/8" groove 1/2" deep
15° bevel
#8 x 1 3/4" F.H. wood screw
30° bevel
1/8 x 15/16 x 27 1/4" spline
#8 x 1 1/4" F.H. wood screw
32 9/16"
3"
4d finish nails
15° bevel
30° bevel
1/8 x 15/16 x 3" spline
EXPLODED VIEW
1/4"
3/4" fir plywood
1/4" walnut plywood
4d finish nail
Mirror
TOP DETAIL
1/4" walnut plywood
Mirror
3/4" fir plywood
1"
#8 x 1 1/4" F.H. wood screw
3/8" round-overs
BASE DETAIL

A CREDENZA WITH CHARISMA





accompanying the Door drawing. Then, mark the mating joints with numbers so you can assemble each frame with the same pieces and in the same order later. Remove the clamps.

3 Align a doweling jig with the marked centerlines, and drill ¼" holes 13/16" deep. (We wrapped masking tape around our drill bit to make sure we drilled all dowel holes to the same depth.)

4 Glue, dowel, and clamp each frame. Check for square and that each frame clamps flat.

5 Sand each frame (front and back) smooth.

6 Bevel-rip the front and back edges of the side frames and the hinged edge of the door frames. Cut to the angles given on the Door and Side Frames and Exploded View drawings.

7 For clearance later, trim ⅛" from the top and bottom edges of the two frames you'll be using for the cabinet doors.

Cut and install the glass stops

1 Plane or resaw four pieces of 3×40" walnut to ¼" thick. Rout ⅛" round-overs along both edges of each ¼" strip for stops C and D. See the Glass Stop detail accompanying the Door drawing.

2 Rip two ½"-wide strips along the edges of each 40"-long piece. Cut one glass stop C and one stop D from each ½×40" strip.

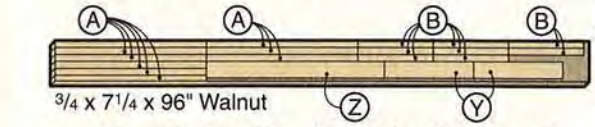
3 Rip the remaining ¼" stock to ¼" wide for stops (E, F).

4 Miter-cut the glass stops (C, D, E, F) to length.

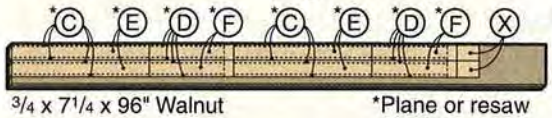
5 Make a bit to drill pilot holes through the walnut glass stops for the brads. To do this, snip the head off a 4d finish nail.

6 Chuck the headless nail into your portable drill. Turn the drill on. By holding the rotating nail against a drum sander or disc sander, reduce the diameter of the nail to the same diameter as the brad in the area shown on the drawing titled Forming a Pilot Bit. Then, sharpen the point. Use the

CUTTING DIAGRAM

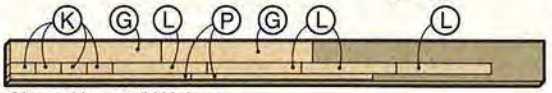


3/4 x 7 1/4 x 96" Walnut

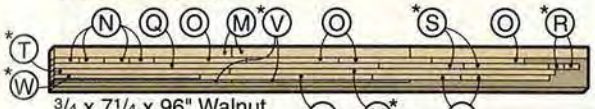


3/4 x 7 1/4 x 96" Walnut

*Plane or resaw to size

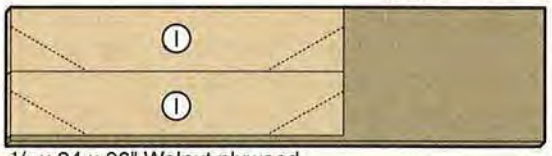


3/4 x 7 1/4 x 96" Walnut

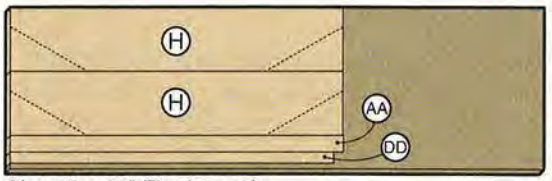


3/4 x 7 1/4 x 96" Walnut

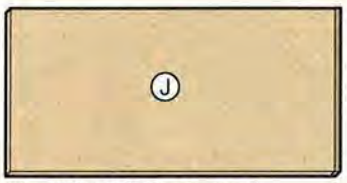
*Plane or resaw to size



1/4 x 24 x 96" Walnut plywood



3/4 x 29 x 96" Fir plywood



1/2 x 30 x 60" Fir plywood

Bill of Materials

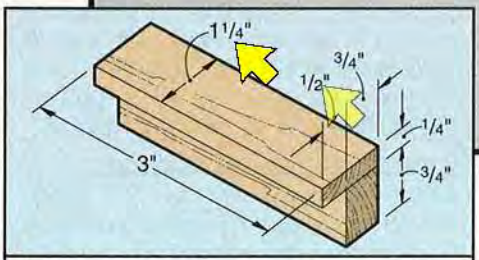
Part	Finished Size T	W	L	Matl.	Qty.
SIDE AND DOOR FRAMES					
A stiles	3/4"	1 1/4"	27 1/4"	W	8
B rails	3/4"	1 1/4"	13 1/2"	W	8
C* stops	1/4"	1/2"	24 3/4"	W	8
D* stops	1/4"	1/2"	13 1/2"	W	8
E* stops	1/4"	1/4"	24 3/4"	W	8
F* stops	1/4"	1/4"	13 1/2"	W	8
SIDE, TOP, BOTTOM, AND BACK PANELS					
G side panels	3/4"	4"	27 1/4"	W	2
H top & btm. core pnl.	3/4"	11 1/2"	59 7/8"	FP	2
I* veneer plywood	1/4"	11 1/2"	59 7/8"	WP	2
J back	1/2"	29 1/4"	59 3/8"	FP	1
MOLDING					
K* trim	3/4"	2"	4 3/4"	W	4
L* trim	3/4"	2"	17 1/16"	W	4
M* trim	3/4"	2"	32 7/8"	W	2
N* trim	3/4"	1"	4 7/16"	W	4
O* trim	3/4"	1"	16 11/16"	W	4
P* trim	3/4"	1"	32 9/16	W	2
Q* trim	3/4"	1"	58 3/8"	W	1

Part	Finished Size T	W	L	Matl.	Qty.
COUNTERTOP MIRROR SUPPORTS					
R supports	1/2"	1"	2 9/16"	W	2
S supports	1/2"	1"	15 3/8"	W	2
T support	1/2"	1"	31 11/16"	W	1
U support	1/2"	1"	56 3/8"	W	1
DOOR STOPS					
V top & btm. stops	1/2"	3/8"	32"	W	2
W door back stop	1/4"	3/4"	26 1/4"	W	1
BASE					
X ends	3/4"	3"	47/16"	W	2
Y angled pieces	3/4"	3"	16 11/16"	W	2
Z front	3/4"	3"	32 9/16"	W	1
AA back	3/4"	3"	59 7/8"	FP	1
BB angled cleats	3/4"	1"	15 1/2"	W	2
CC front	3/4"	1"	31"	W	1
DD cleat	3/4"	2"	58 1/4"	FP	1

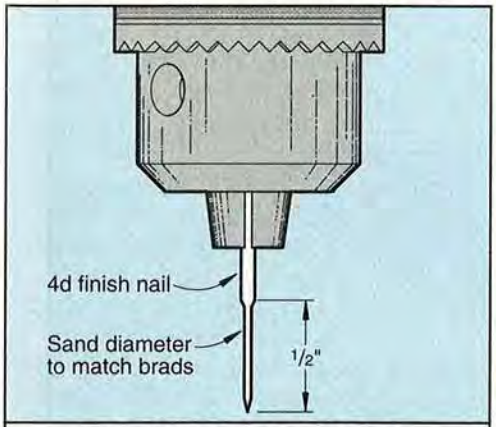
*Initially cut parts marked with an * oversized. Then, trim each to finished size according to the how-to instructions.

Material Key: W–walnut, FP–fir plywood, WP–walnut plywood

Supplies: 1/4" dowel pins 1 1/2" long, 3/4" × #17 brads, #8 × 1 1/4" flathead wood screws, 4d finish nails, #8 × 1 3/4" flathead wood screws, countertop contact cement, 2–#4 × 1/2" brass roundhead wood screws, heavy-duty double-faced foam mounting tape, single-strength glass, single-strength mirror, stain, finish.



GLASS-STOP POSITIONING JIG

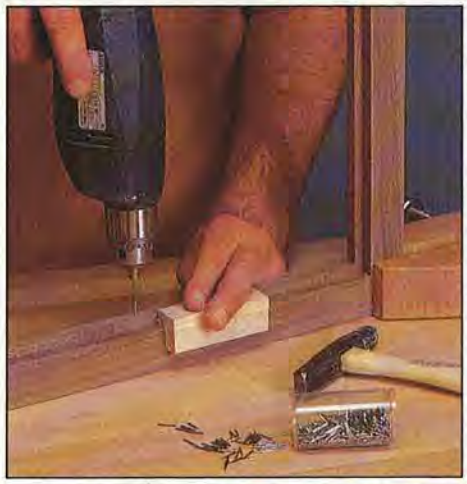


FORMING A PILOT BIT

drill and "pilot bit" to drill the pilot holes through the glass stops. As shown in the Glass Stop detail accompanying the Door drawing, we angled the pilot holes in stops E and F.

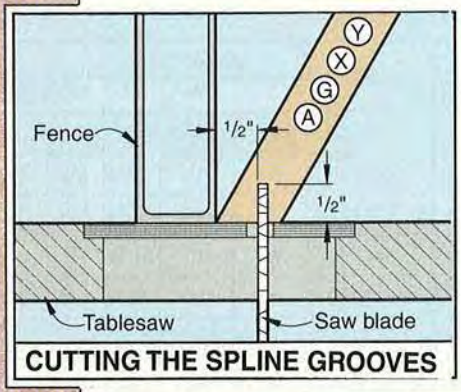
7 Construct the positioning jig shown *above*. Now, as in the photo *right*, use the jig to position the *front* stops (C, D). Tap the brads into the holes just drilled. Secure the *front* stops to the door and side frames. Set the brads and fill

Continued



Using the glass-stop positioning jig for the correct spacing, drill the pilot holes for the nails.

A CREDENZA WITH CHARISMA



CUTTING THE SPLINE GROOVES

the holes (we used FIX walnut putty). Save the remaining stops—you'll use them later when installing the glass.

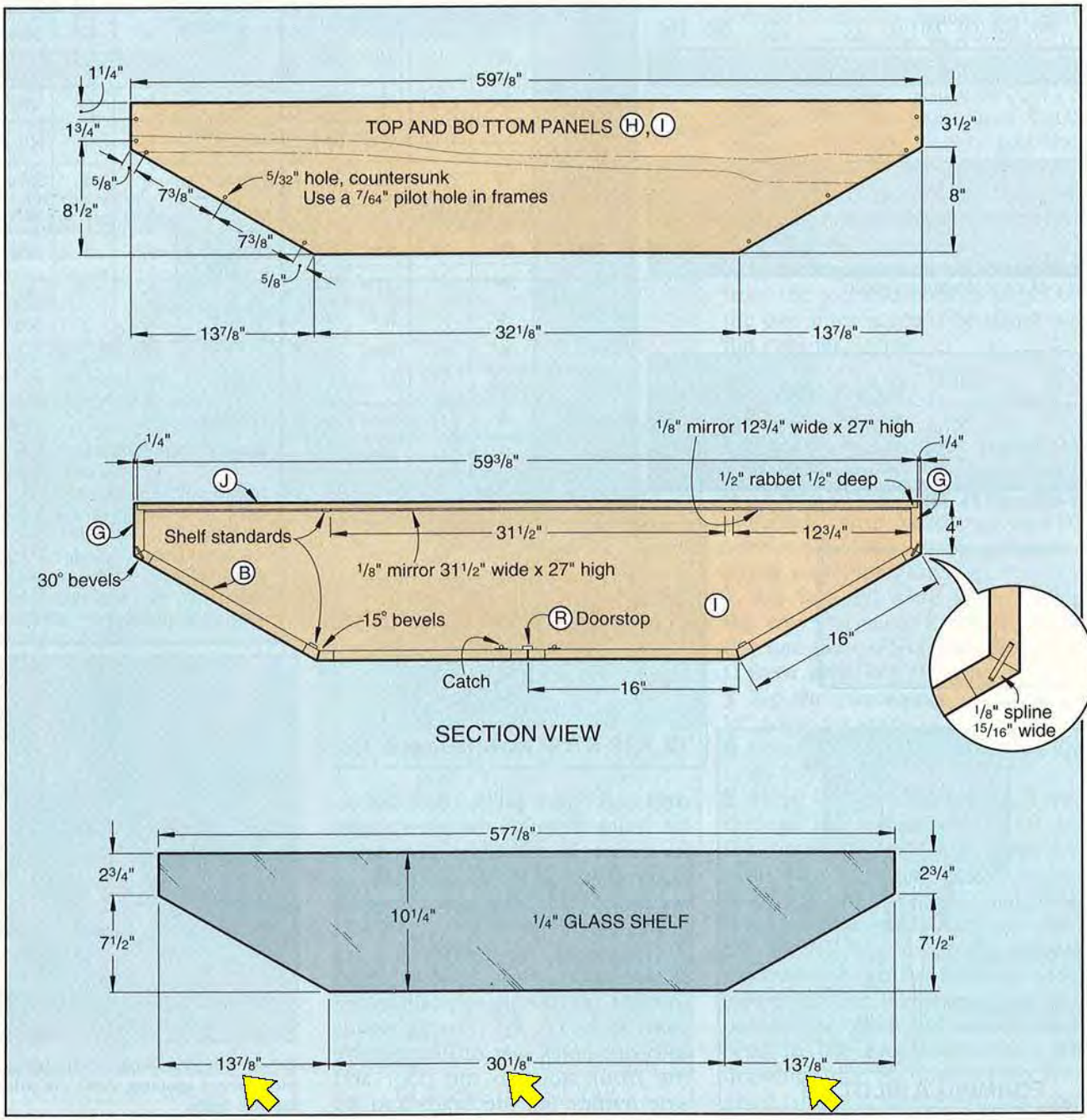
Machining the all-important side panels

1 Cut the side panels (G) to size, bevel-ripping the front edge of each at 30°.

2 For joining the side panels (G) to the side frames (A, B) later, cut a ⅛" spline groove ½" deep in the front mitered edge of each side panel and side frame where shown on the drawing titled Cutting the Spline Grooves.

3 From ⅛" stock, cut two splines to 15/16 × 27¼". (We used hardboard, but you could resaw your own stock.)

4 Cut a ½" rabbet ½" deep along the back inside edge of each side panel (G).



Prepare the cabinet top and bottom

1 To form the laminated top and bottom panels, start by cutting two panels (H) of ¾" plywood to the shape indicated on the Top and Bottom Panels drawing.

2 From ¼" walnut plywood, cut the two interior panels (I) to the same shape as the ¾" plywood panels (H) *plus* an extra ¼" on the front and sides.

3 With an even overhang on the front and side edges (keep the back edges flush), glue and clamp one ¼" panel (I) to a ¾" panel (H) where shown on the Exploded View drawing. (We applied two coats of countertop contact cement to each mating surface. Read the instructions on the can before applying.) Repeat for the second panel.

4 Fit your router with a flush-trim bit, and rout the edges of the ¼" panels flush with the edges of the ¾" panels.

Assemble the components

1 Cut four plywood corner braces to the dimensions shown on the drawing at *right*.

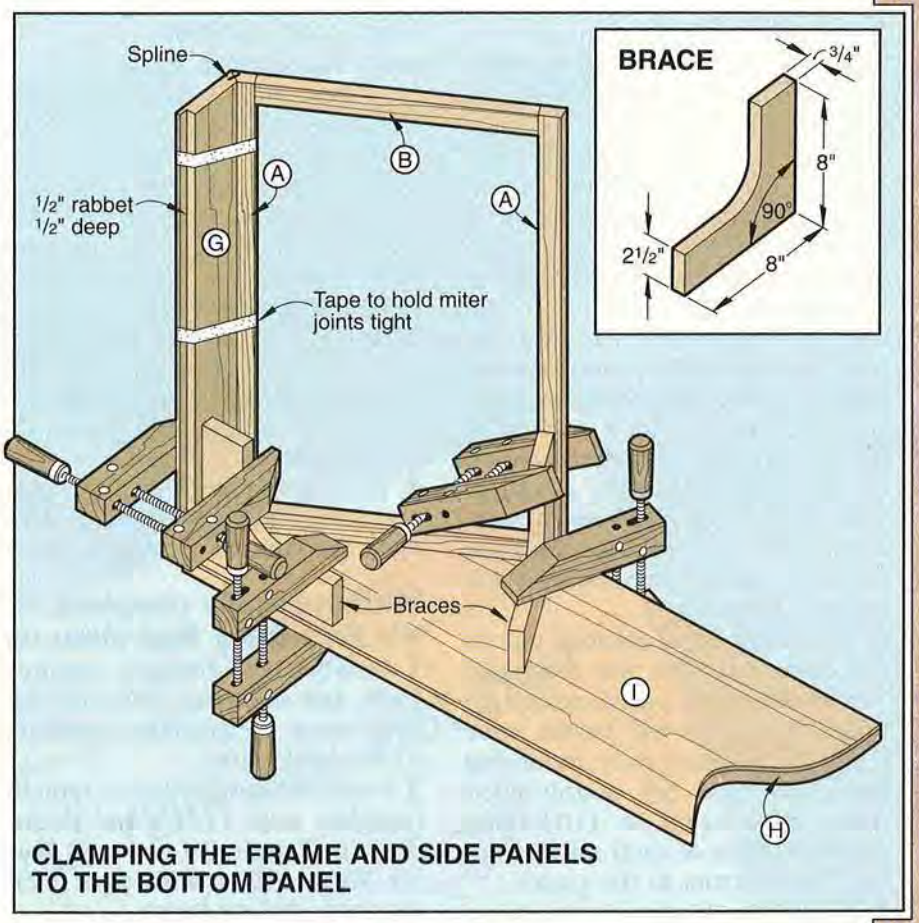
2 Glue and spline the two side panels (G) to the two side frames (A, B). Check that the mitered joints close flush (we used masking tape to hold the mitered-and-splined edges together.

3 Immediately glue and clamp the two assemblies (A, B, G) to the laminated bottom panel (H, I), with the back and outside edges flush. As shown in the drawing *right*, use the corner braces to keep the assemblies square to the bottom panel.

4 Further secure the side panels and frames to the bottom panel with screws. Drill and countersink screw mounting holes where shown and to the sizes stated on the Top and Bottom Panels drawing. Drive the screws.

5 Now, glue and clamp the top panel (H, I) to the top ends of the frames and side panels in the same manner with the ¼" walnut plywood facing the inside of the cabinet. Drill the holes and drive the screws.

6 Cut the plywood back (J) to size. The top of the back panel should be flush with the top of the top panel (H, I) and flush with the bottom of the bottom panel (H, I). See the Base detail accompanying the Exploded View drawing for reference. Drill the mounting holes, and screw the back panel in place.



CLAMPING THE FRAME AND SIDE PANELS TO THE BOTTOM PANEL

Add the walnut molding

1 Cut two pieces of ¾"-thick walnut to 2×96" long for trim pieces K, L, M and two pieces to 1×96" for N, O, P.

2 Rout a ½" cove along one edge of both pieces of the 1"-wide stock. Switch bits, and rout a pair of ⅜" round-overs along one edge of the 2"-wide stock.

3 Mark a reference line on the top and bottom panels ¾" back from the front edges where shown as a dashed line on the Exploded View drawing.

4 Miter-cut the trim pieces to length, drill pilot holes, and glue and nail pieces K, L, and M to the top and bottom of the cabinet, keeping the back edges of the trim pieces flush with the marked reference line. Then, add the coved trim pieces N, O, and P.

5 Measure the distance between the two K trim pieces, and cut the back trim piece (Q) to fit between them.

Attach the shelf standards and mirrors

1 Hacksaw four shelf standards (two brown and two cadmium-plated) to 27" long. Be careful when cutting that the notches align from the bottom up for level-sitting shelves later.

Continued

A CREDENZA WITH CHARISMA

2 Remove the back panel (J) from the cabinet assembly. Stain the front face of the panel with walnut stain.
3 Position the back panel on your workbench, and attach the cadmium-plated standards to the back panel where shown on the Section View drawing. (Although the standards come with mounting nails, we used wood screws to ensure the standards wouldn't work loose.) Screw the brown-colored standards to the back surface of the side frames (A) where shown on the Exploded View drawing. (We found that the brown standards were less obvious than the cadmium-plated standards in the mirror's reflection.)
4 Have the back mirrors cut to the sizes listed on the Exploded View drawing. (Remeasure to make sure yours will be the same size.) Place heavy-duty mounting tape (we used 3M double-sided foam tape, catalog no. 110) along all back edges of each mirror. Adhere the mirrors to the panel.
5 Mount the hinges to the doors and then to the side frames where located on the Door and Side Frames drawing. Drill the hole for each pull. (We used two nails supplied with the pull.) Then, add a #4×½" brass roundhead wood screw in the center hole. (We were afraid that if we used just nails for the pulls that they'd work loose over time.)

Add the cabinet top mirror supports and door stops

1 Cut the countertop mirror supports (R, S, T, U) to size.
2 Glue the supports in place where shown on the Exploded View drawing.
3 Cut the door stops (V, W) to size, and glue them to the cabinet top and bottom and left-hand door. (In addition to acting as door stops, the pieces also diminish the amount of dust that enters the finished cabinet.
4 Fasten the catches to the door frames and door stops.

Rest your cabinet on a handsome base

1 Cut base pieces (X, Y, Z) to the sizes listed in the Bill of Materials, miter-cutting the ends as previously described. Then, cut the grooves in the ends of the base pieces as shown on the drawing titled Cutting the Spline Grooves. Cut the splines to size.
2 Cut the remaining base pieces (AA, BB, CC, DD) to size. Drill the mounting holes in parts (BB, CC, DD). Glue, spline, and clamp the base together.
3 Turn the cabinet upside down and fasten the base to the cabinet. Turn the cabinet right-side up.

With assembly complete, it's time for a final clean up

1 Remove the hinges, catches, pulls, and standards from the cabinet. Leave the standards attached to the back panel.
2 Finish-sand the cabinet, remaining glass stops (E, F), and doors.
3 Stain if desired (we used Bartley Walnut filler with stain). Later, apply a clear finish.
4 Using the previously drilled holes in the glass stops (C, D, E, F) as guides, drill mating holes in the adjoining pieces. Install the glass in the doors and side frames. Drill the pilot holes, and nail the glass stops (E, F) in place.
5 Reattach the hinges, catches, pulls, and standards to the cabinet and doors.
6 Take the cabinet to a glass shop to have the mirror top cut to fit. As an option, you also could cut a piece of ¼" walnut to fit, and place it in the opening. If so, install a few more supports underneath the walnut plywood to prevent it from bowing.
7 Have ¼" glass shelves cut to the shape shown on the Glass Shelves drawing. With the cabinet sitting upright and the back off, position the glass shelves inside the cabinet on top of the base. Fasten the back to the cabinet.
8 Position the shelf clips, and set the glass shelves on the clips.

Buying Guide

• **Hardware.** Three pair of ¾×2" non-mortise hinges with finials, four brass double-ball catches, two 30" brown standards, two 30" aluminum standards, 12 shelf supports, and two pulls. Kit no. 71187, $43 ppd. Geneva Specialties (a division of Klockit), P.O. Box 636, Lake Geneva, WI 53147. Or, call 800/556-2548 to order.

Produced by Marlen Kemmet Project Design: Jim Boelling
Photographs: John Hetherington Illustrations: RoxAnne LeMoine

WOOD® readers show their stuff

HOME WORKSHOPS THAT WORK

Editor's note: *WOOD magazine has no responsibility for the design and construction of the units or idea projects from the readers shown in this article. Plans, drawings, or other details are not available from this magazine. But if you find something of interest, write us and we'll put you in contact with the readers featured.*

Ivan James can make room for the family car in a jiffy just by rolling his shop out of the way. He's customized most of his woodworking machines by outfitting them with mobile bases featuring locking casters. Because of this mobility, a central dust collection system proved impractical. Yet, Ivan controls dust.

The 24×40×24¾" base for the benchtop tablesaw brings the machine to standard working height and features a swing-up outfeed table. Note the hanging light fixtures over each workstation.

Of all the correspondence we get at *WOOD*® magazine, our favorite kind comes from readers who want to share woodworking successes or solutions. That's certainly the case with the shops you'll see here and on the following pages. Both of our featured readers sent us photos of their shops in response to an Ask WOOD™ request for shop layout ideas. Here's hoping that you'll find these shops every bit as inspiring as we did.

Mobility in Illinois

Ivan James, of Jacksonville, Illinois, began his letter by admitting that he'd gone through "several phases of trial and error" before finding the answer for his shop. "I realized that I had limited space in my two-car garage and that I needed mobile equipment so that I could accommodate our automobile at the end of the day." His letter went on to explain how he modified most of his shop machinery to accomplish that.

"I eliminated the wide-spread legs that were furnished with the tablesaw, 6" sander, and radial-arm saw," wrote Ivan. "Now, I have wheels under all of those

Continued

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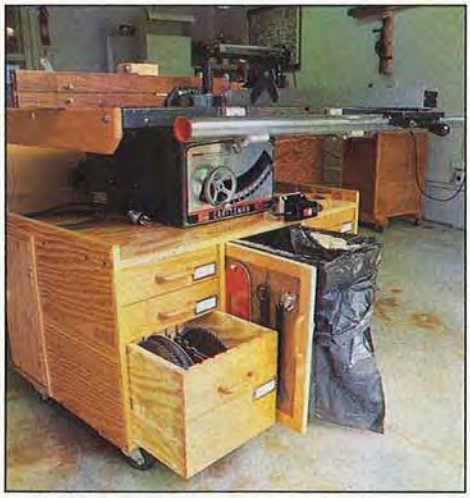
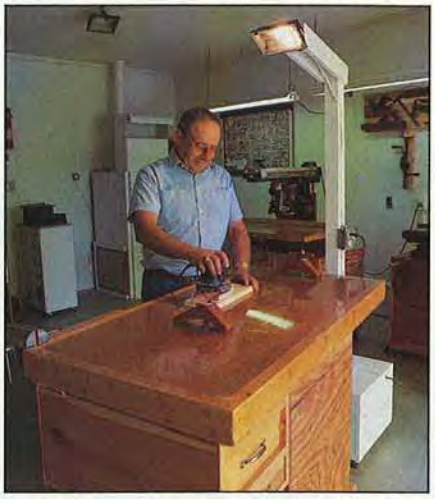


Because of his shop's mobile nature, Ivan has devised a sawdust-gathering system at each machine. His tablesaw base has a pullout dust bin as well as handy storage.



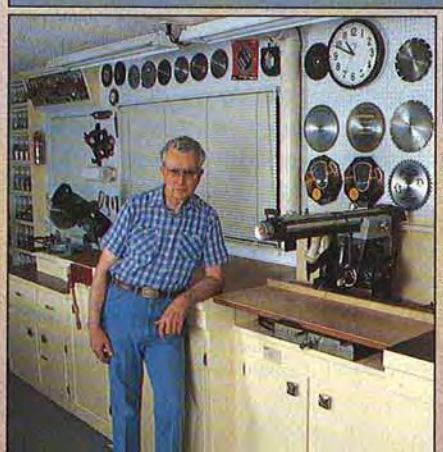
For potent lighting where needed, Ivan built a weighted, boxed base and stand for the mobile, 150-watt quartz lamp. The light stands 75" high.

machines, plus my hand-tool cabinet, 1" belt sander, and the router table (as shown in the photo *previous page*). The bandsaw, though, still has the manufacturer's legs, as does the planer. And, my workbenches don't have to be mobile ones because they always remain in place."

Due to Ivan's need for mobility, he hasn't installed a dust-collection system, but he has addressed the problem at each workstation (see tablesaw photo *left*).

Ivan concluded by commenting, "This shop has developed over the past 10 years, and although it may not be everyone's answer, it works for me. No doubt that I would have a different ar-

Californian has a place for everything



Above. Gil Wilmer has about everything anyone needs for woodworking—and a place for it—in his garage shop that occupies two bays. His tablesaw, in the foreground, has a 72" fence-guide rail and offfeed table. Gil regularly waxes and buffs all tabletops.

Left. The wall behind Gil serves as visible storage for a variety of radial-arm and miter-saw blades, as well as dado accessories. The paint on the pegboard not only makes the shop brighter, it fills the holes a trifle so hangers hold better.

rangement if I could get out of the garage and into a separate building as my shop."

Well, even if Ivan never gets his own, special-use building, he's still obviously very happy: "I only make things for a hobby, but I spend about six hours a day, five days a week at it."

The day we visited him, was, of course, not one in which to get much woodworking done, what with having to move equipment this way and that for the proper camera angle. But Ivan seemd to enjoy the experience, evidencing real pride of ownership. And we enjoyed the time, too. Thanks Ivan for all the tips, and your old-fashioned hospitality.

This Illinois woodworker has reserved one rear corner of the garage for the permanent installation of his two workbenches. The tall tool-storage cabinet on the right has a mobile base, but tucks right in place for access during benchtop work.

"Over 40 years ago, when I was newly married and attending college, I built a house in the evenings and on weekends," Gil Wilmer, of Fair Oaks, California, began his letter. "Although time was at a premium, I wasted a great deal of it digging through tool boxes that were always disorganized. I swore then that someday when I could, I would have an organized shop!"

Today, as you can see in the photos *left* and *right*, Gil has realized his dream. His shop occupies two bays of the three in his garage. In it, he has a 10″ radial-arm saw, a 10″ industrial tablesaw with a 72″ fence, a shaper, an 8″ jointer, a bandsaw, a thickness planer, and two belt-and-disk sanders. There are also five workbenches, a locked power-tool storage cabinet, a parts-and-fasteners storage cabinet, and outside, a two-bag dust collector and an air compressor. He added some amenities, too: a stereo, tape deck, and a television. Gil concludes, "Believe it or not, there's still space left for a full-sized automobile—and a little compact car!"

We're glad your dream came true, Gil. Thanks for taking the time to spend with us.

A complete do-it-yourselfer as well as a woodworker, Gil has neatly arranged his collection of hand tools over his workbench according to size. Shelves, lidded clear-glass jars, and hardware drawer organizers to the right help him establish order for all of his small parts and fasteners. *Inset*: No tangled cords and piles of tool bodies in Gil's shop! A floor-to-ceiling cabinet stores portable power tools, and includes holders for bits and accessories.

Do you have a shop to share?

If these two readers' shops have you saying to yourself, "Hey, I've got a pretty nifty shop, too," why not send us some snapshots? Your shop doesn't have to be large or elaborate, but if it features a layout or idea you'd like to share, we'd like to see it. Who knows? We might even decide to drop in for a personal visit. Send your photos and details to: *Reader Shops,* WOOD *magazine, 1912 Grand Ave., Des Moines, IA 50309-3379.*

Photographs: Todd V. Phillips and Gary A. Zeff

Invite these hotshots to stick around

WILD FOWL (and we mean wild!) FRIDGE MAGNETS

Normally, we don't get very excited about refrigerator magnets. But then we saw what talented designer Judy Gale Roberts could do with them! Her wacky birdland hipsters are such a hoot we knew you'd want to scrollsaw your own set.

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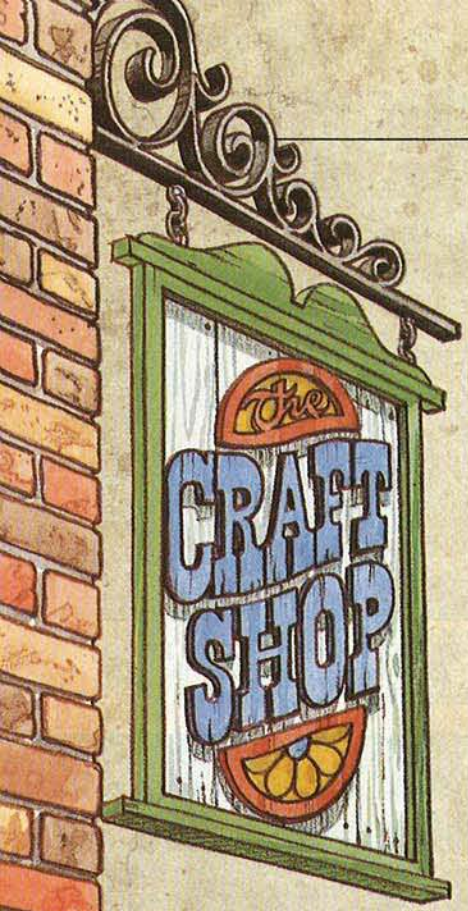


***Scrollsaw the zany birds** from ⅛"-thick basswood or plywood. All of the patterns will fit on a 7×11" piece of material.*

Transfer the five outlines from the full-sized patterns to your stock. Photocopy the patterns and adhere them to the wood with rubber cement or spray adhesive, highlighting the cutting lines with a colored pencil. Or, you can try a disappearing fabric marker, as we did. Here's how.

Lay tissue paper (the kind used for gift wrapping) over the pattern and trace the cutting line with a fine-line permanent marker. Lay the tissue paper faceup on your stock, and trace the cutting line with the disappearing fabric marker (available at fabric and sewing stores). It marks the wood through the tissue paper with a purple line that remains visible for about 24 hours.

Fit your scrollsaw with a #4 blade (.033×.014" with 15 teeth per inch). Saw the patterned pieces apart for easier handling, and then cut out each shape. The thin stock lends itself readily to stack cutting; just place two or three additional pieces of stock beneath the patterned piece, holding them together with double-faced tape between the layers.

Now, go wild with colors. Decorate your birds with red, blue, orange, dark brown, and light brown markers as shown in the photograph, or devise your own color schemes with acrylic paints, watercolors, or stains. Draw the black lines with a permanent marking pen.

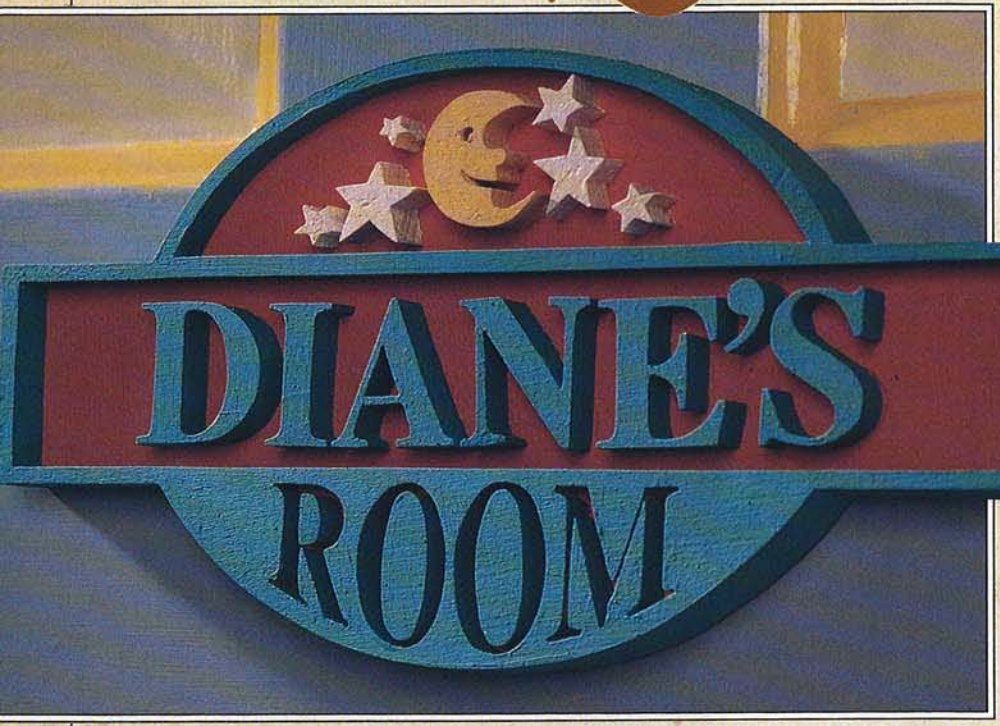
Coat each bird with clear polyurethane. Glue a magnet onto the back of each one with cyanoacrylate adhesive. (We used 3/16"-thick, ½"-diameter button magnets from a craft shop.) Then, head for the kitchen and give that refrigerator a dose of goofiness.

Project Design: ©Judy Gale Roberts
Photographs: Wm. Hopkins

Print this article

V.I.P. DOOR PLAQUE

Kids love to see their names on things, so you can be certain they'll take a liking right away to having their very own door sign. And you're going to be a big hit, too, for helping them stake out their special space.



Photocopy the full-sized sign pattern (*opposite page*), the ornament of your choice, and the alphabet letters on *page 40*. Trace the ornament into the arc at the top of the sign.

Now, trace the letters for the name onto the pattern. Allow about 1" at each end of the name, extending the length of the sign's nameplate, if necessary.

With rubber cement or spray adhesive, attach the completed pattern to a piece of 1×6 pine of appropriate length. Then, refer to the article on *page 40*, and bandsaw the stock into two thinner pieces. Follow the steps described there to complete the sign, except for a few special instructions:

- Leave your scrollsaw table set at 0° for all cuts.
- When sawing out the word "room," cut around the innermost line of the R and O's first, and then along the outer lines.
- Paint the cutout pieces before final assembly, following the color scheme in the photo or one of your own. (We used artist's acrylics to paint ours.)

Allow the paint to dry, and then glue the pieces together as explained in the technique article. For best results, scrape the paint away from spots where you'll be gluing.

Project Design: Perry McFarlin
Illustrations: Perry McFarlin
Photograph: Wm. Hopkins Jr.

Cut both top and bottom layers on purple line
FULL-SIZED PATTERNS
Cut red pieces from top layer; white designates waste areas of top layer
DIANE'S ROOM
Extend both sides evenly to accomodate longer names
1/8" blade start hole

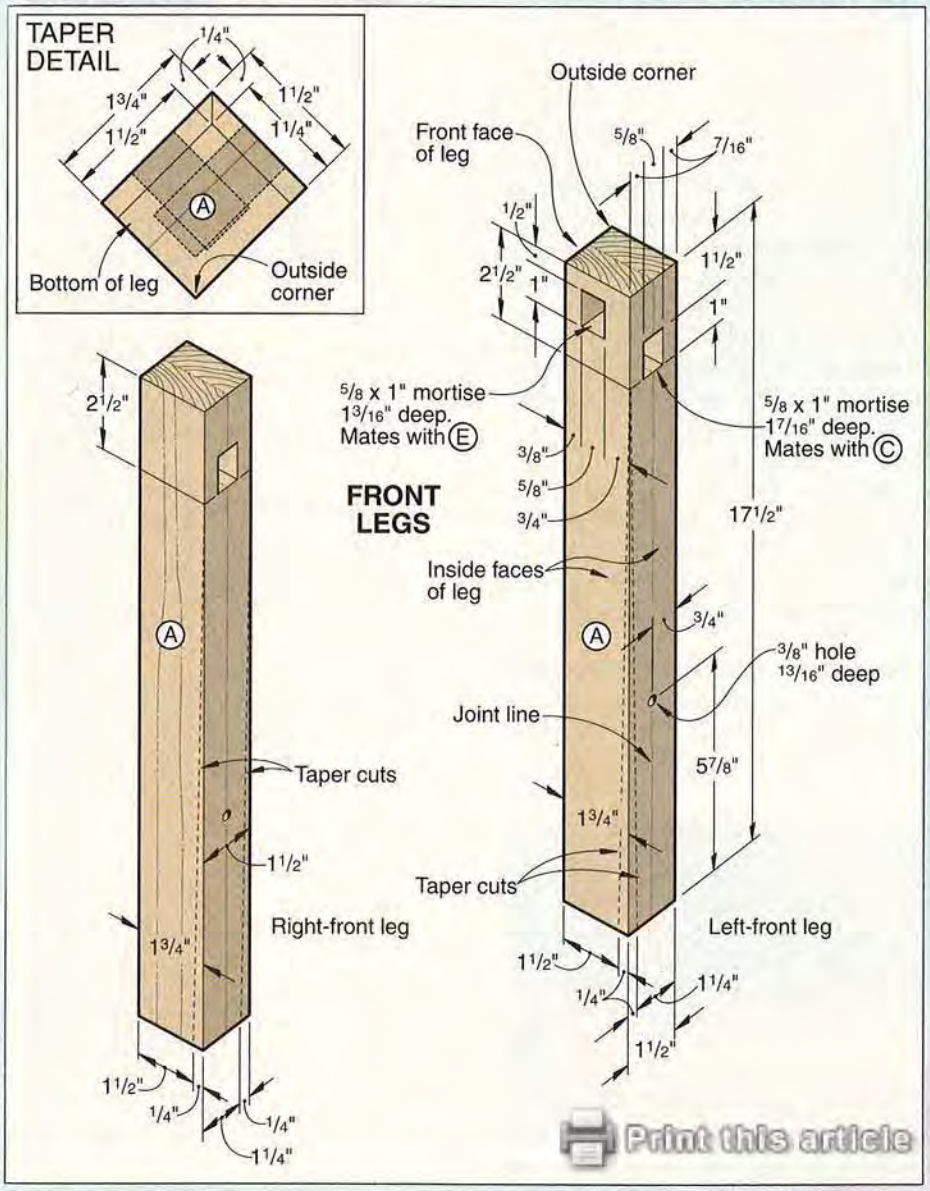
Elegant-Oak

Dining Chairs

Complement the distinguished-looking table we featured in our February 1993 issue with a set of these elegant matching chairs. Mortise-and-tenon joinery makes for rock-solid construction, and our padded-seat design guarantees an oh-so-comfortable dining experience.

***Note:** The instructions, Bill of Materials, and Cutting Diagram are for one chair. Adjust for the number of chairs you plan to build.*

To lay out the rear legs, you can enlarge the Rear Leg grid on page *74 or order a full-sized pattern. To order, send $2 and a 7×10" self-addressed envelope with 58¢ postage to* WOOD *Magazine's Mission Chair, 1912 Grand Avenue, Des Moines, IA 50309-3379. For a photocopy of the table article from issue 59, send a self-addressed stamped #10 envelope and $2 to* WOOD *magazine.*



Start with the front legs

1 Use 1½"-thick stock for the front legs (A) if you have it. If not, rip and crosscut four pieces of ¾"-thick stock to 1⅞" wide by 18" long. To allow for trimming later, these dimensions are slightly larger in length and width than those on the Front Legs drawing.

2 Spread an even coat of glue on the mating surfaces. With the edges and ends flush, glue and clamp two pieces face-to-face to form each leg. Repeat the process to laminate the second front leg.

3 Scrape the glue from one edge of each leg, and then joint or plane that edge flat, removing no more than 1/16" of stock. Now, rip the opposite edge for a 1¾" width. Crosscut both ends of each leg for a finished length of 17½".

4 Mark the locations for the mortises and dowel holes where shown on the Front Legs drawing. Be sure to lay out the legs in pairs that contain a left and a right leg.

5 Cut the mortises and drill the dowel holes in each leg. (To form the mortises, we drilled overlapping holes to remove most of the waste stock, and then chiseled the mortises square. You also can leave the ends of the mortises round, and use a rasp to round the ends of the mating tenons.)

6 Mark a pair of taper lines on two surfaces (the same surfaces as the mortises) of each leg where shown on the Front Legs drawing and accompanying Taper detail. Bandsaw the tapers where marked (you could also make the cuts using a taper jig). Sand the tapered surfaces smooth to remove the saw marks.

Continued

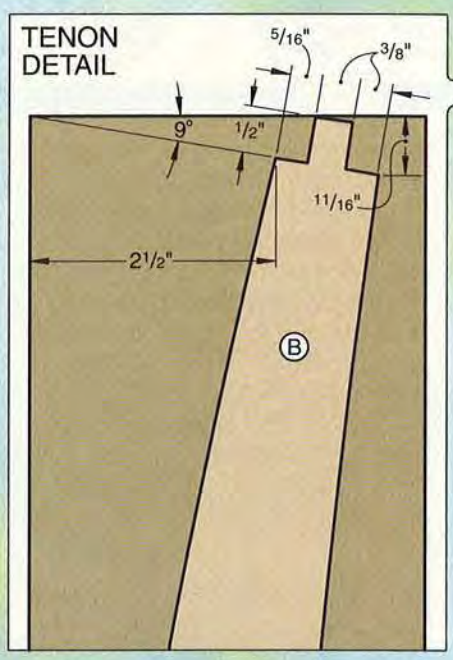
Lay out, cut, and machine the rear legs

1 From 1 1/16"-thick stock, cut two pieces 4" wide by 35" long for the rear legs (B). Then, cut a piece of thin plywood or hardboard to the same size for use as a template in the next step.

2 Cut a piece of paper to 4×35", and mark 1" grid lines on it. Transfer the rear-leg outline, dowel-hole centerline, tenon, and mortise locations from the Rear Leg Side View drawing. Refer to the Tenon detail for dimensions when laying out the tenon. (To lay out the curved front and back outlines, we cut a ¼"-thick strip of wood to 1" wide by 37" long. Using a helper to position the flexible strip of wood, we positioned one edge of the strip against the marked points on the gridded paper. Holding the wood strip firmly in place, we marked the curves for the front and back edges of the leg.) Keep flat the 2"-wide area where the top rail (C) joins the rear leg.

3 Using spray adhesive, adhere the paper pattern (or the full-sized pattern you ordered from us) to the 4×35" template stock. Cut the template to shape.

4 Using double-faced tape, adhere the two leg blanks together face-to-face, with the edges and ends flush. Next, apply spring clamps to position and hold the template on the leg blanks where shown in photo A and dimensioned on the Rear Leg Side View drawing.



5 As shown in the photo *below*, use a square to transfer the mortise location and dowel-hole centerlines to the rear leg blanks. Next, transfer the leg outline. Separate the template from the leg blanks. Drill the dowel holes (we did this on our drill press, using a brad-point bit). Next, chisel the mortises to shape.

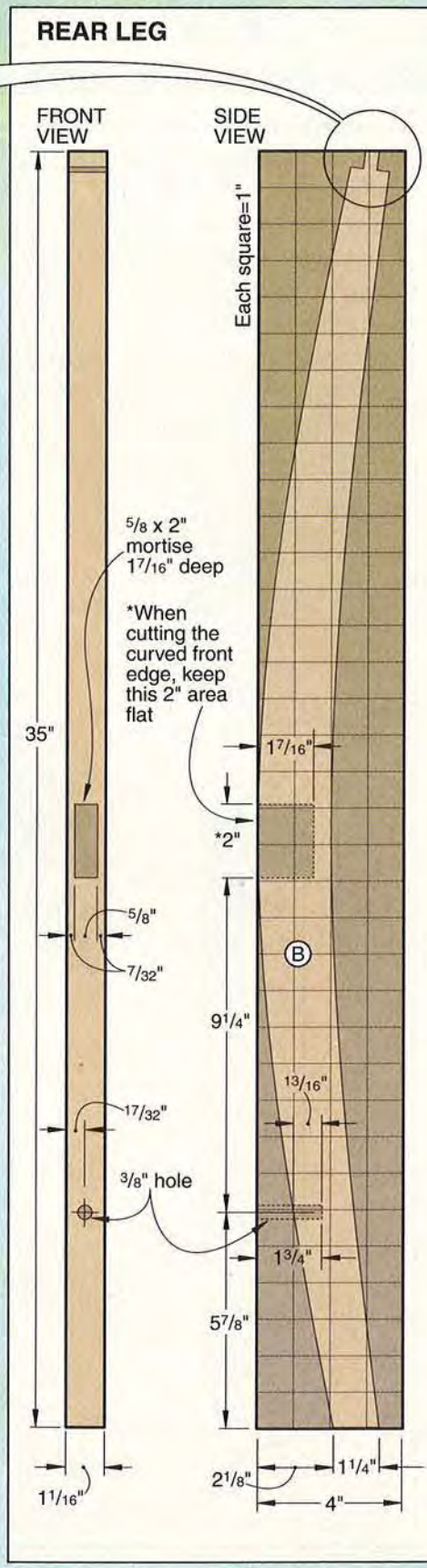
6 Bandsaw the rear legs to shape, and bandsaw the tenons to shape. (We used a ¼" blade.) Sand the edges of the legs smooth. Using a wood wedge, pry the legs apart.

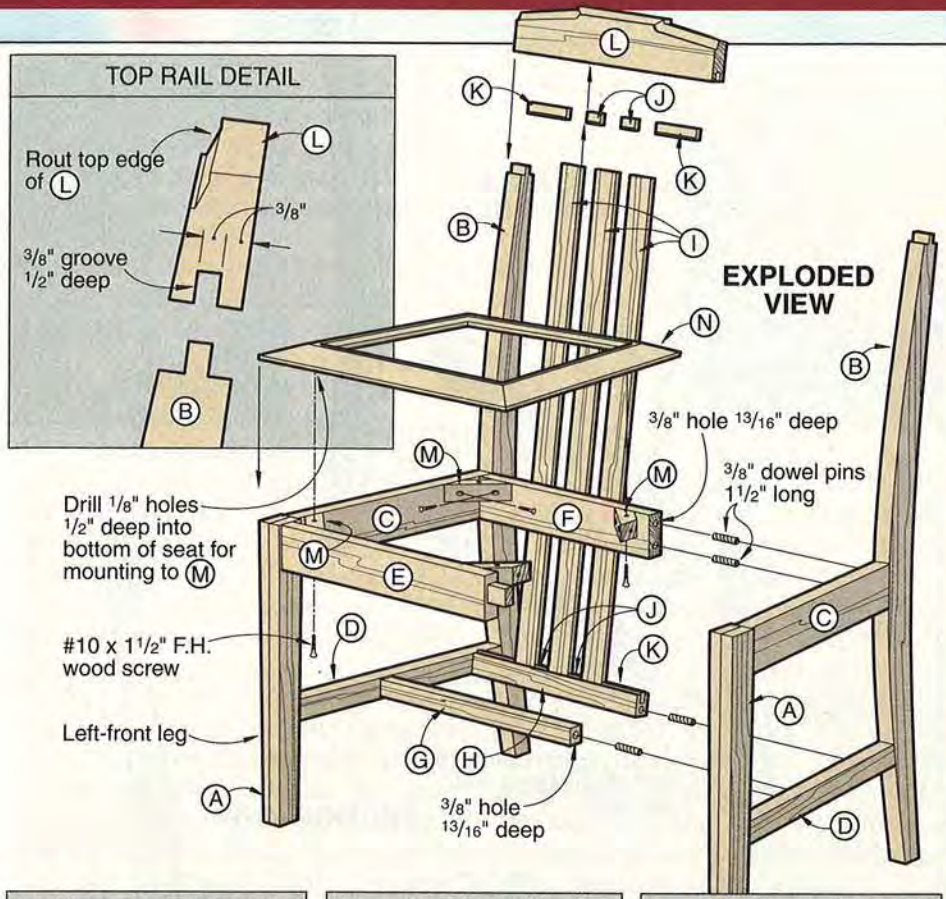
The upper rails come next

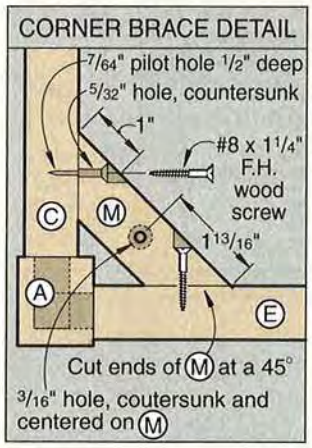
1 From 1 1/16"-thick stock, cut the upper side rails (C) to the size listed in the Bill of Materials.

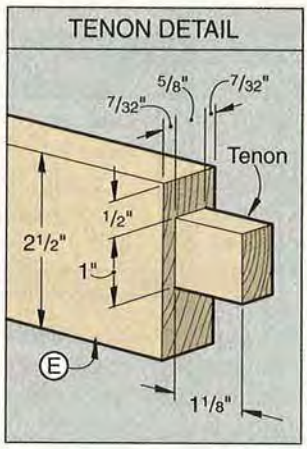
Continued

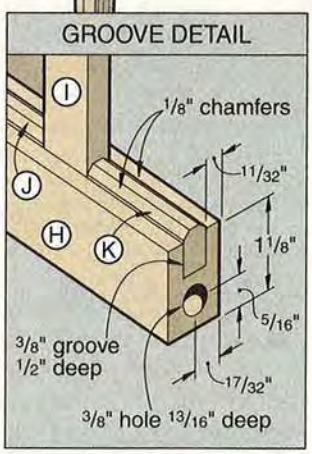
Transfer the mortise location, dowel-hole centerline, and leg outline to the rear leg blanks from the template.




TOP RAIL DETAIL
Rout top edge of L
3/8"
3/8" groove 1/2" deep
EXPLODED VIEW
3/8" hole 13/16" deep
3/8" dowel pins 11/2" long
Drill 1/8" holes 1/2" deep into bottom of seat for mounting to M
#10 x 11/2" F.H. wood screw
Left-front leg
3/8" hole 13/16" deep


CORNER BRACE DETAIL
7/64" pilot hole 1/2" deep
5/32" hole, countersunk
1"
#8 x 11/4" F.H. wood screw
113/16"
Cut ends of M at a 45°
3/16" hole, coutersunk and centered on M





Bill of Materials For One Chair

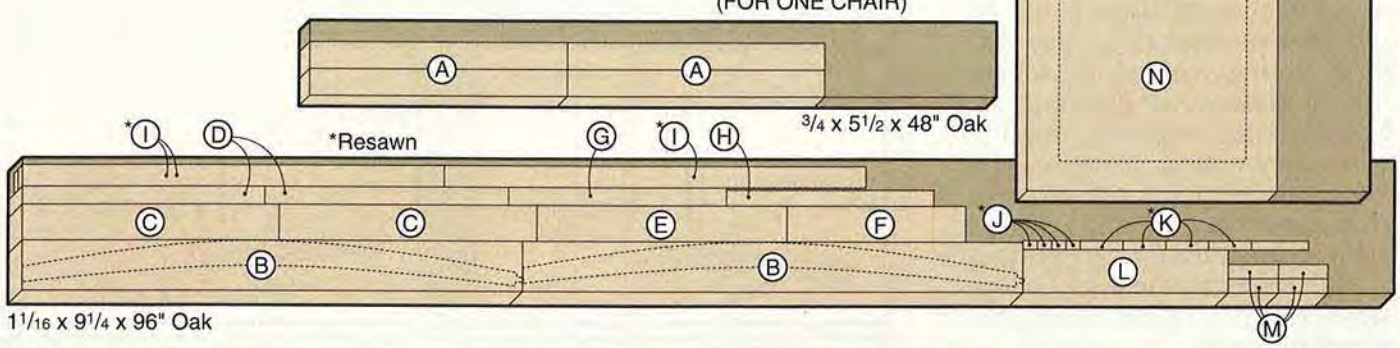
Part	Finished Size T	W	L	Matl.	Qty.
A* front legs	1½"	1¾"	17½"	LO	2
B* rear legs	1 1/16"	4"	35"	O	2
C upper side rails	1 1/16"	2½"	16⅞"	O	2
D* lower side rails	1 1/16"	1¼"	15 9/16"	O	2
E front rail	1 1/16"	2½"	15 1/16"	O	1
F back rail	1 1/16"	2½"	13¼"	O	1
G stretcher	1 1/16"	1"	13¼"	O	1
H stretcher	1 1/16"	1⅛"	13¼"	O	1
I slats	⅜"	1½"	29 3/16"	O	3
J spacers	⅜"	⅝"	1⅛"	O	4
K spacers	⅜"	⅝"	3¼"	O	4
L top rail	1 1/16"	3"	15⅜"	O	1
M brace	1 1/16"	1 1/16"	3⅝"	O	4
N seat	¾"	15¼"	15½"	PW	1

Cut parts marked with an * oversized. Then, trim each to finished size according to the how-to instructions.

Material Key: LO–laminated oak, O–oak, PW-plywood.

Supplies: spray adhesive, double-faced tape, ⅜" dowel pins 1½" long, #8×1¼" flathead wood screws, #10×1½" flathead wood screws, 1"-thick foam, ⅝"×#18 nails for webbing, ⅜" staples for seat cover, vinyl or fabric for seat cover, stain, clear finish.

CUTTING DIAGRAM
(FOR ONE CHAIR)



2 Using the dimensions on the Tenon details accompanying the Side Frame Assembly drawing at *right*, carefully lay out a tenon on each end of the upper side rails (C).

3 Cut the tenons. (We cut them out of scrap stock first to verify the settings. We did this on a tablesaw using a miter gauge fitted with an auxiliary fence and stopblock. The stopblock helped ensure even-lengthed tenons.) Check the fit of the tenons in their mating mortises and trim if necessary. For reference when gluing the same joints later during assembly, make matching marks on both mating pieces at each joint.

4 Mark the pair of dowel-hole centerpoints on the *inside* face, rear end of each upper rail (C) where dimensioned on the Tenon detail at *far right* .

Now, cut the lower rails

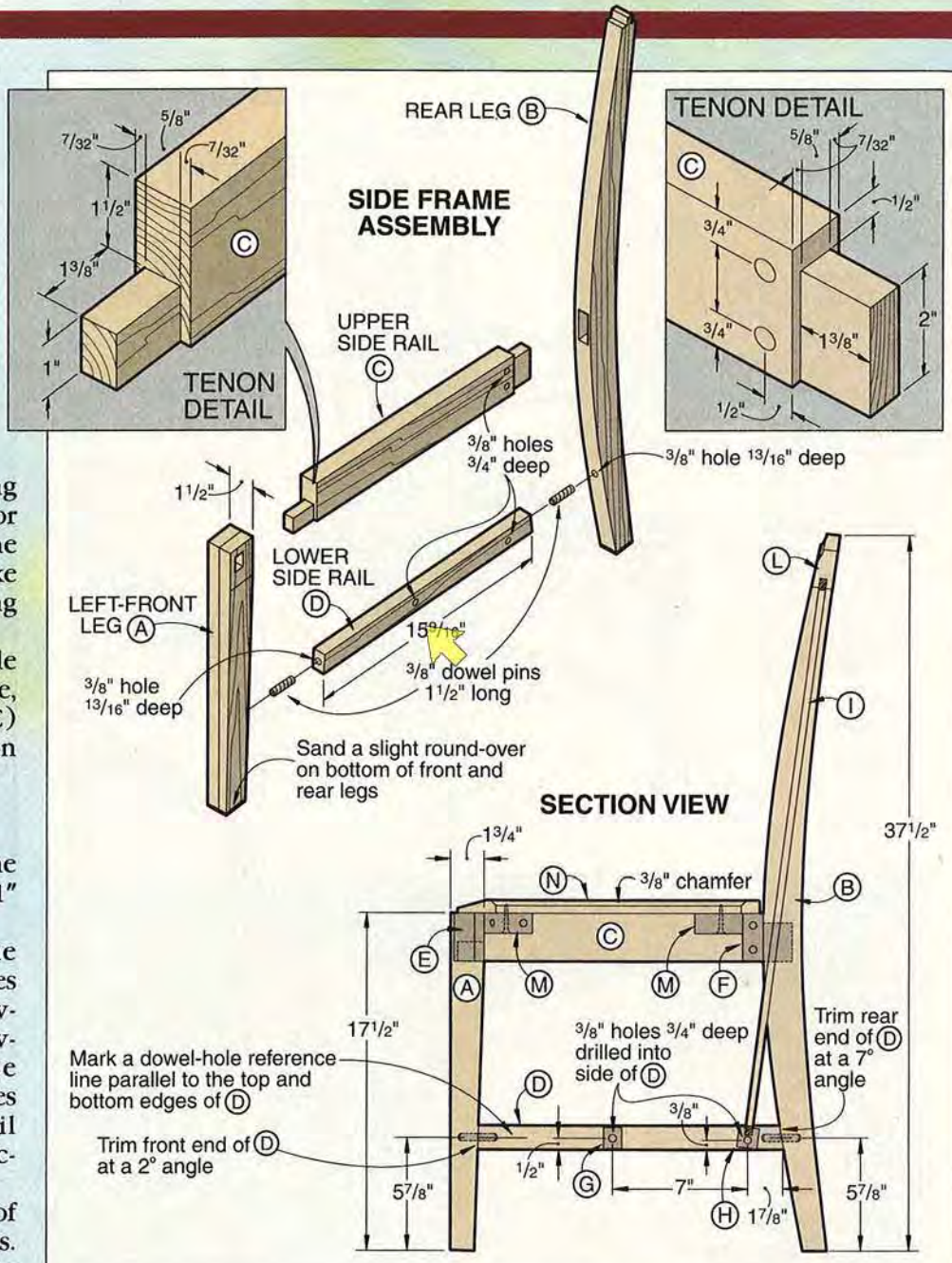
1 From 1⅛"-thick stock, cut the lower side rails (D) to size plus 1" in length.

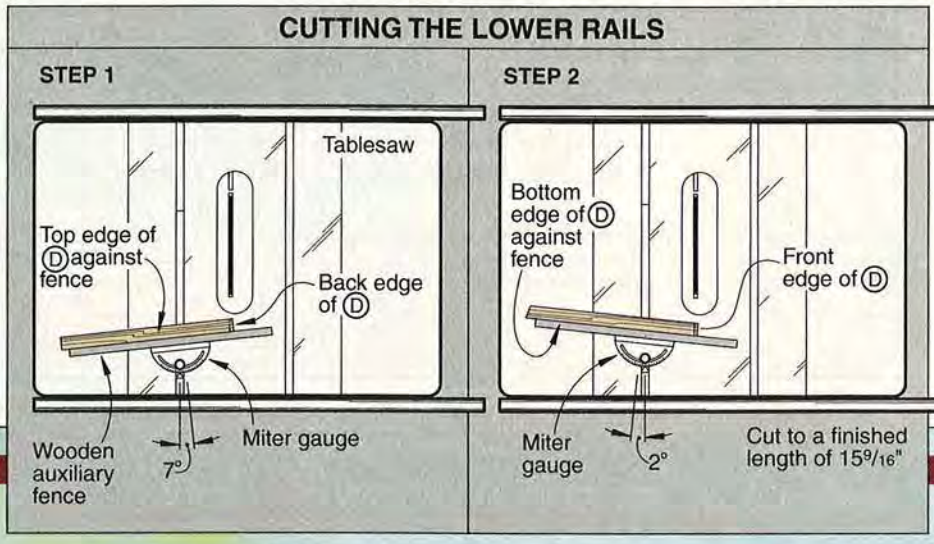
2 Using the dimension on the Side Frame drawing and angles shown on the Section View drawing, miter-cut the ends of the lower side rails. Next, mark the centerpoints and drill dowel holes in the inside face of each rail where dimensioned on the Section View drawing.

3 To drill the hole in each end of the rails, mark their centerpoints. Extend a reference line *parallel* to the top and bottom edges of the rail. Secure the rail in a bench vise. Chuck a ⅜" brad-point bit into your portable drill. Align the bit with the marked lines, and drill the holes to 13⁄16" deep.

4 Mark the centerpoints, and drill the dowel holes for parts G and H where located on the Section View drawing.

5 Dry-clamp the side frame rails (C, D) between the legs (minus the dowels) to check the fit, and trim if necessary.





Shape the rails and stretchers

1 Cut the front rail (E) to size. Using the Tenon Detail accompanying the Exploded View drawing for dimensions, machine a tenon on both ends.

2 Cut the back rail (F) to size.

3 To transfer the dowel-hole centerpoints to the ends of the back rail (F), position ⅜" dowel centers (you'll need four) in the previously drilled dowel holes in the back inside surface of the upper rails (C). Clamp the front and back rails (E, F) between the side frame assemblies.

4 With the assembly dry-clamped, cut the front stretcher (G) and rear stretcher (H) to fit snugly between the lower rails (D).

5 Drill a dowel hole centered in each end of the front stretcher (G). Mark the dowel-hole centerpoints on the ends of the rear stretcher (H) where dimensioned on the Groove detail accompanying the Exploded View drawing. Drill the holes.

Slip in the slatted backrest

1 Cut and sand the backrest slats (I) to size. They're easier to sand now than when glued in place.

2 Cut a piece of stock to ⅜×⅝×20" for spacers (J, K). Cut or rout a pair of ⅛" chamfers along one edge of the 20" strip where shown on the Groove detail accompanying the Exploded View drawing. Then, crosscut the middle spacers (J) to length from the long strip.

3 Using the Part View drawing for reference, cut the backrest top rail (L) to shape.

4 Fit your table-mounted router with a raised-panel bit with a ½" cutter (we used a Bosch 85583M). Rout along the top front edges of the backrest top rail (L). Do not rout the ends, bottom, or back of the rail.

5 Cut a ⅜" groove ½" deep along the bottom edge of the backrest top rail (L) and along the top edge of the rear stretcher (H). The top rail groove is cut ⅜" from the *back* face. The groove in the rear stretcher is centered.

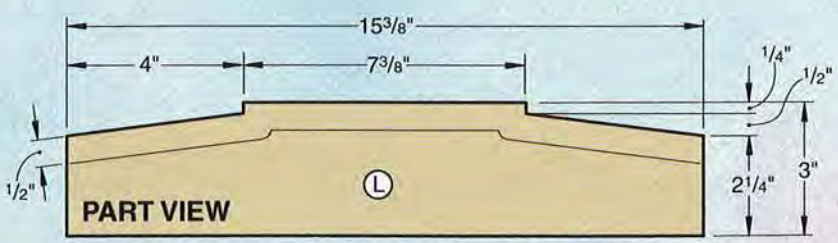
6 Stain the slats and back surface of the back rail (F). It's easier to do this now than with the chair assembled. (We used WOOD-KOTE Danish walnut stain).

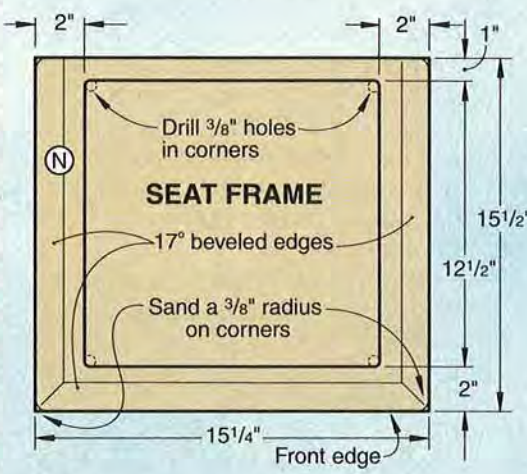
7 Glue, dowel, and clamp the stretchers (E, F, G, H) between the side frames. To angle the rear stretcher (K), stick one end of a slat in the groove in the rear stretcher, and align the top end of the slat with the rear leg tenons. (To give us a bit more working time, we used white glue.)

8 Working from the center out, glue and clamp the slats, spacers, and top rail (L) in place. Doing this now will automatically angle the rear stretcher (H). (We used masking tape to hold the spacers in place until the glue dried.)

9 Miter-cut the braces (M) to length. Drill the holes, and then glue and screw them to the chair frame. See the Corner Brace detail for reference.

10 Finish-sand and stain the chair and apply the finish. (We applied two coats of Minwax fast-drying clear-gloss polyurethane, followed by a coat of Minwax fast-drying clear semi-gloss polyurethane.)





Add the oh-so-comfortable padded seat

1 From ¾" fir plywood, cut the seat frame (N) to shape. The outside edges of the seat should be ⅛" in from the outside edges of the top rails (C, E, F).

2 Using the Seat Frame drawing *above*, lay out and cut the border for the opening with a jigsaw. (We drilled ⅜" blade start holes first.) Sand the cut edges.

3 Tilt your tablesaw blade 17° from vertical, and rip the front and side top edges of the seat frame where shown on the Bevel-Ripping the Seat Frame drawing on the next page.

4 Rout a ⅜" chamfer along the inside top edge of the seat-frame opening. Sand a ⅜" radius on the sharp front corners of the seat frame to round them off. Sand a slight round-over on all edges.

5 Starting at the center and working out, nail one end of the center piece of webbing to the seat frame, pull the opposite end tight, nail it in place, and cut off the excess. Nail the other four strips running front to back in place. See the Buying Guide for our chair webbing source. Then, starting at the front and working back, weave and nail the remaining webbing in place where shown on the Forming the Seat drawing and accompanying detail.

Continued

6 To help hold the 1"-thick seat foam in place when applying it in the next step, cover all four edges of the plywood seat frame with double-faced (carpet) tape. (We purchased our foam at an upholstery supply store.) Left untaped, the foam tends to pull away from the edges.

7 Lay the seat frame on a piece of 1" foam. Use a utility knife with a sharp blade to trim the edges of the foam flush with the edges of the seat frame.

8 Cut a piece of vinyl (or fabric) to 24" square, and lay it good side down on your workbench. Position the seat frame, foam side down, centered over the vinyl.

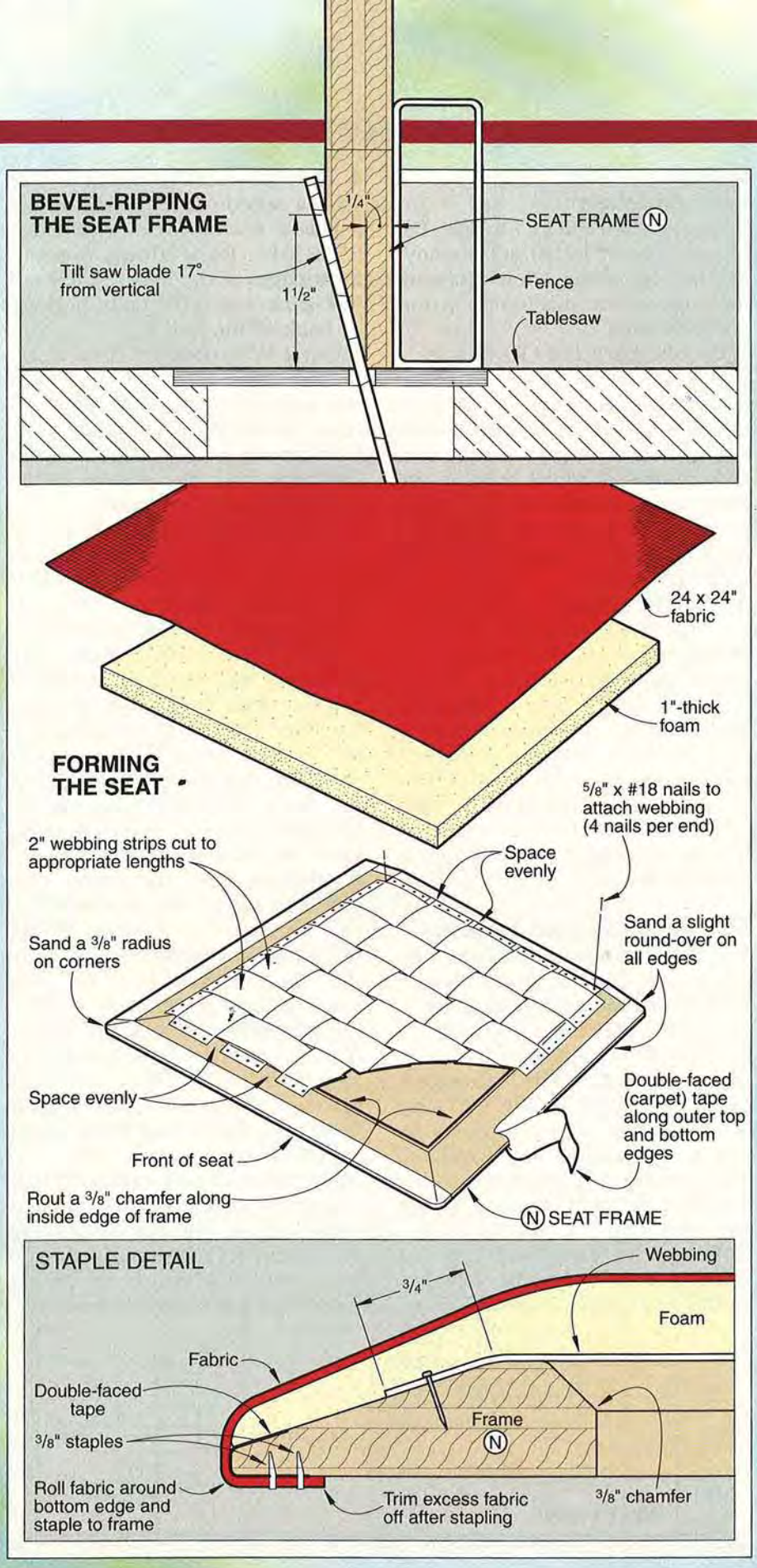
9 Staple the back edge of the vinyl to the bottom side of the seat frame. Pull the front edge of the vinyl tight over the frame to remove any ripples, and staple the vinyl in place. See the Staple detail accompanying the Forming the Seat drawing. Fold the corners until they're smooth, pull tight, and staple the sides of the vinyl to the frame. Trim the vinyl on the bottom side of the seat frame where shown on the detail.

10 Position and center the seat on the chair frame. Use the previously drilled holes in the braces as guides to drill pilot holes in the bottom side of the seat frame. Drive screws through the four braces into the seat frame to fasten it securely to the chair.

Buying Guide

• **Chair webbing.** 16′ needed per chair, stock no. 84947, $17.95 per chair (special kit price for *WOOD* readers), multiply by the number of chairs you'll be building, plus $5.50 postage and handling per order. The Woodworkers' Store, 21801 Industrial Blvd., Rogers, MN 55374-9514. Or call 612/428-3200 to order.

Produced by Marlen Kemmet
Project Design: James R. Downing
Photographs: Wm. Hopkins
Illustrations: Kim Downing



HIGH-VOLUME, LOW-PRESSURE SPRAYERS

THE FINISH GOES ONTO THE PROJECT, NOT INTO THE AIR

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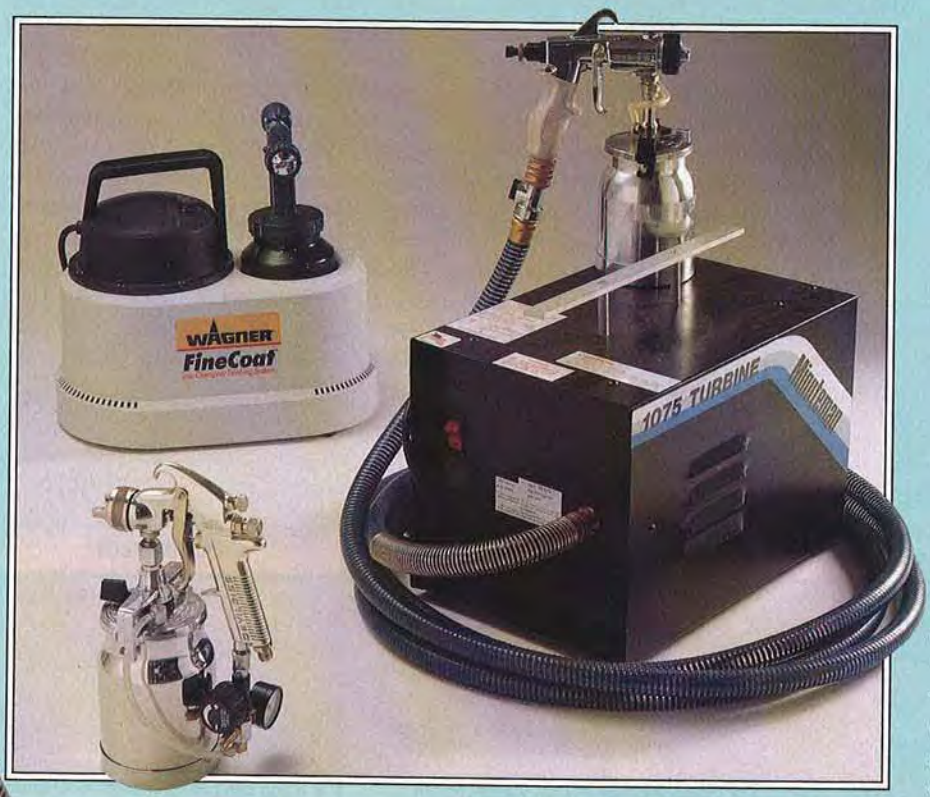


In addition to the Campbell Hausfeld HV2000 shown *below* and *top*, we tested the models in the photo *above (clockwise from bottom left)*: DeVilbiss JGHV-604, Wagner FineCoat, and the Minuteman FT-1075.

If you've stayed away from traditional spraying systems because of cost, or because of the clouds of overspray, we've got good news! Today's high-volume, low-pressure (HVLP) spraying systems start at around $200. (That's about $300 less than earlier models designed strictly for professional use.) And, unlike compressed-air systems, HVLP products help you put most of the finish on the project, not into the air.

How HVLP compares to other spray systems

Few things in woodworking help you work faster *and* improve quality, but you'll benefit in both areas when you spray a finish onto your projects. You can spray a finish in a fraction of the time required to brush or wipe it on, and you'll have fewer blemishes to deal with—bubbles, brush marks, or lint specks.

For years, professionals have relied on compressor-driven, high-pressure spraying systems. These conventional spray guns require at least 40 pounds per square inch (PSI) of pressure to atomize a finish into extremely small droplets. Since these droplets weigh little and travel at fast speeds, many of them bounce back off a

Continued

HVLP SPRAYERS

workpiece, or miss it entirely, and become suspended in the air. Because of this overspray, as little as 35–40 percent of the sprayed finish winds up on the project; the remainder pollutes the surrounding air.

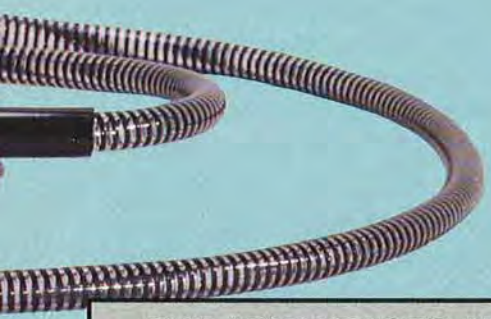
To save money and for convenience sake, most hobbyists have relied on aerosol spray cans. This alternative may be your best choice if you do only a little finishing, but it also has disadvantages as spelled out in the chart *below*.

Unlike either of these options, HVLP systems operate at low pressures (about 4 psi). So, they spray larger droplets traveling at slower speeds. Most of these droplets adhere to your project, and few of them go into the air. In our tests of various HVLP systems, we were able to finish projects with half as much paint, stain, clear finish, or other material as required by a compressed-air system. In fact, manufacturers of HVLP systems claim that their products transfer up to 86 percent of a finish to a surface. (A reasonable claim according to our tests.)

Note: *Even though HVLP systems create little overspray, you still should wear a respirator. Always provide ventilation when working in confined spaces.*

How to select an HVLP system for your needs

For this article, we tested three turbine-based machines: the Campbell Hausfeld HV2000, the Minuteman FT-1075, and the Wagner FineCoat (all shown on the *previous page*). All three products have turbines that send a high volume of air through a 1"-or-so diameter hose at low pressure to a gun. When you press the gun's trigger, the air forces the finish out the gun's nozzle. When you let go of the trigger, the air bypasses the gun's cup and goes out the nozzle.



THE ADVANTAGES AND DISADVANTAGES OF THREE SPRAY-FINISHING OPTIONS

OPTION	ADVANTAGES	DISADVANTAGES	COMMENTS
AEROSOL SPRAY CAN	• Convenient (Easy to use, little cleanup) • You don't have to invest in spray equipment	• High cost per ounce of finish • Overspray • Because of thin consistency, finish tends to run • Because of low solids content, you need to apply many coats to build up finish	• A good choice for small projects.
CONVENTIONAL HIGH-PRESSURE SPRAYING SYSTEM	• Highest-quality finishes possible • Spray guns cost as little as $30 • Easy to control application of finish because you can spray light coats that dry relatively quickly • You can use the air compressor for other pneumatic tools	• Overspray pollutes air, wastes finish, and covers all unprotected surfaces in spraying area • Heavy compressors not easily mobile • Cost of compressor	• If you can put up with the overspray, conventional systems will help you get the best possible results.
HVLP SPRAYING SYSTEMS	• Little overspray • Efficient use of finish material • Turbine-based systems are easy to use and portable • High-quality finishes possible • Cheaper to get into than high-pressure spraying system if you don't own a compressor	• Turbine-based systems make noise constantly as you use them • Finish tends to go on heavy, so you have to wait longer for it to dry • Turbine-based systems have bulky hoses to contend with • Best systems cost over $500	• With practice in technique and thinning of finishes, you can produce good results with an HVLP system. Low overspray and new, lower-priced units make these systems well-suited for home woodworkers.

The fourth product we tested, the DeVilbiss JGHV-604, operates on a compressor just as conventional guns do. But, unlike conventional guns that use siphon action to draw finish from the cup, the DeVilbiss gun uses pressurized air to push the finish out of the cup and through the gun's nozzle.

Today's market offers you many choices in products similar to the Minuteman and DeVilbiss units. We chose these two models as representatives of your many choices in these types of HVLP sprayers.

With both the Campbell Hausfeld and Wagner systems, you can purchase a complete HVLP system for under $300. Although the Campbell Hausfeld costs more, it produced slightly better results than the Wagner, as shown in the chart *below*. We also preferred the large-mouthed, quick-attaching cup on the Campbell Hausfeld over the smaller, screw-on cup that comes with the Wagner.

Those inexpensive systems probably won't stand up to professional use, however, so you should invest in heavier-duty machines such as the Minuteman or DeVilbiss products if you plan to use them daily. The entire Minuteman system weighs 45 pounds, so you can easily move it from place to place.

Manufacturers' listing

Campbell Hausfeld
800/543-8622

DeVilbiss
800/338-4448
800/465-9455 (Canada)

Minuteman
800/733-1776

Wagner
800/328-8251

Written by Bill Krier
Technical consultant: Chuck Hedlund
Photographs: Hopkins Associates

HOW HVLP SYSTEMS STACK UP AGAINST EACH OTHER AND CONVENTIONAL SPRAY GUNS*

MANUFACTURER	MODEL	EASE OF SETUP	EASE OF USE	EASE OF CLEANUP	QUALITY OF SPRAYED FINISHES: OIL-BASED STAIN	OIL-BASED LACQUER AND POLYURETHANE	WATER-BASED CLEAR FINISHES	OIL-BASED PAINT	LATEX PAINT	WARRANTY	WEIGHT (POUNDS)	LIST PRICE	SELLING PRICE
CAMPBELL HAUSFELD	HV2000	7	8	5	7	7	7	8	7	1 year	15	$289	$279.00
DeVILBISS	JGHV-604	4	7	5	7	8	7	8	6	1 year	3	497	497.00
MINUTEMAN	FT-1075	7	8	5	7	7	7	8	7	1 year	45	899	674.95
WAGNER	FineCoat	8	4#	4#	7	6	6	8	7	1 year	14	190	190.00
TYPICAL COMPRESSOR-DRIVEN SPRAY GUN		6	8	5	7	9	8	8	6	Varies	3	–	30-200

NOTES:

* Ratings based on a 1 - 10 scale, with 10 being the highest possible rating.

\# Low scores due to screw-on cup with undersized mouth that prevents you from putting your hand inside of cup. Otherwise, product rates equally in these categories with other models.

$ Selling prices based on catalogs, advertisements, and dealer and manufacturer inquiries at time of article's production.

A new addition to the HVLP race

As we put the wraps on this article, officials at Wagner introduced a step-up version of their FineCoat system called the FineCoat CS2000. We weren't able to test this new product, but it apparently has improvements that address the shortcomings of its lower-priced brother. (The CS2000 lists for $349 compared to $190 for the original unit.)

Wagner FineCoat CS2000

As you can see in the chart *left,* our main gripe with the original FineCoat is its plastic, screw-on cup with a narrow mouth. Unless you have small hands you'll have difficulty cleaning this cup. Wagner representative John Rau told us that the CS2000 has an aluminum cup with a locking lever, and that most hands will fit inside of the cup. The new gun also gives you greater spraying control because it has adjustments for air *and* fluid flow (the original gun has one control for fluid only). The CS2000 shares the same turbine as the original unit.

Our advice: the original FineCoat offers good value for most home hobbyists and other occasional users. The CS2000 meets the needs of more serious users, and competes with the Campbell Hausfeld HV2000.

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BIRD-IN-THE-HAND ALE BOWL

Continued from page 51

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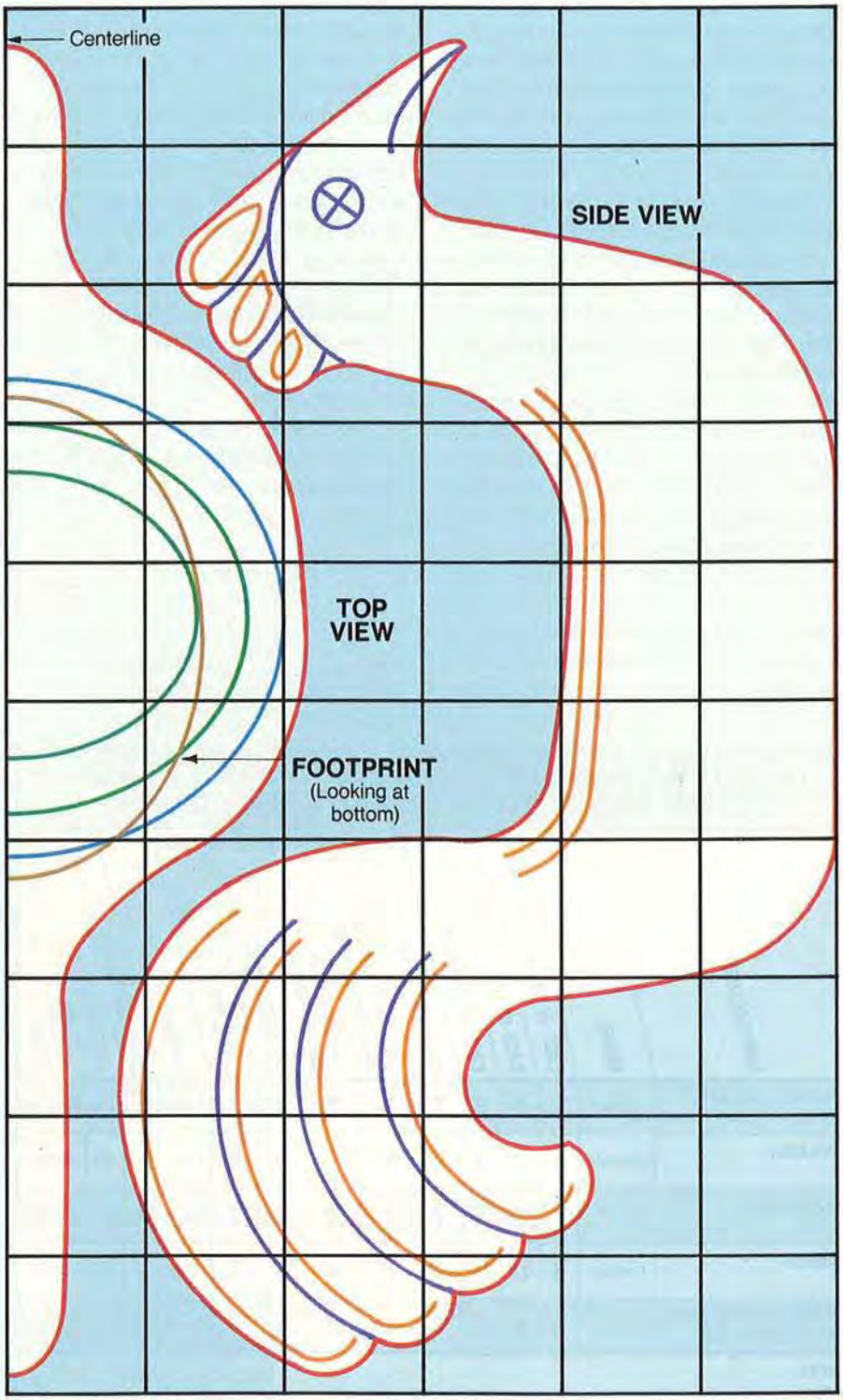

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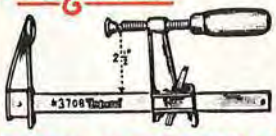

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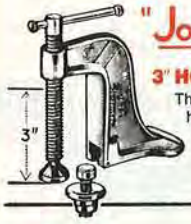

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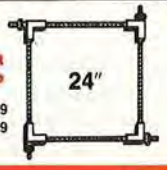

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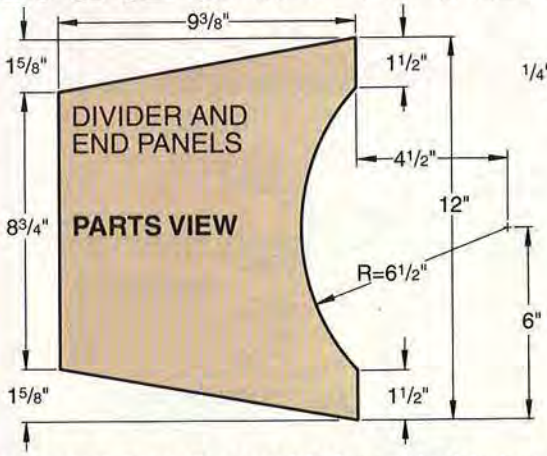

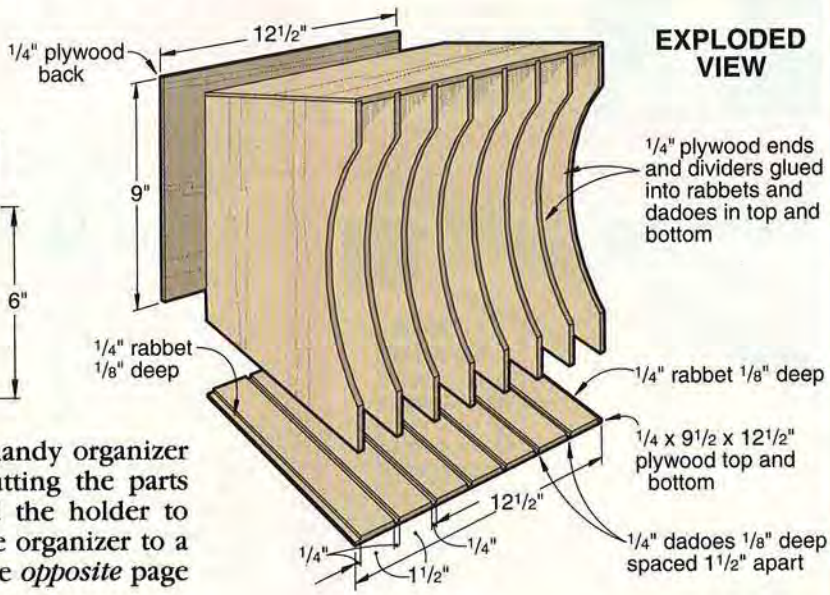
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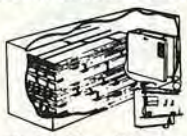

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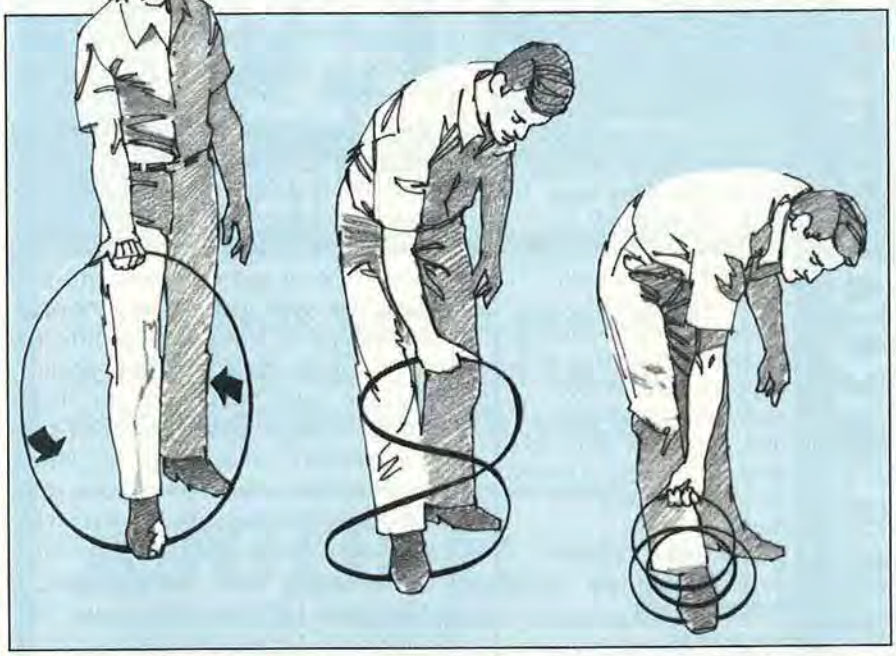

SIMPLE AS ONE, TWO, THREE

Our readers have shown us several ways of folding bandsaw blades. Here's how one of them, Werner Zinn of Orlando, Florida, described it:

Hold the blade in front of you with one hand, keeping the teeth pointing away from you. Wear a glove if you've got one handy. Put your foot inside the loop and step on the blade, securing it firmly to the floor. Simultaneously rotate and lower your hand as you hold the top of the blade. By the time your hand makes ¾ to one full revolution, the blade will have popped into three coils.

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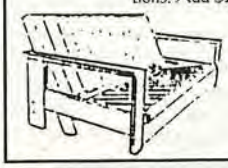

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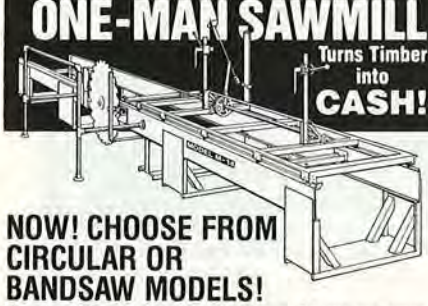

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PRODUCTS THAT PERFORM

Print this article

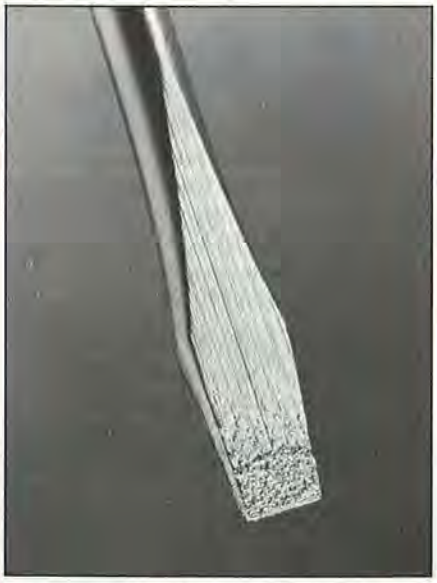
SHOP TESTED

Screwdriver delivers a no-slip, no-strip performance

At one time or another we've all experienced the frustration of screwdriver *cam-out*. This term refers to the tendency of screwdrivers to slip off the head of a slotted- or Phillips-head screw as you apply torque. This often strips the screw head or mars the surface of your workpiece.

In answer to this problem, the Grrip line of screwdrivers and bits have tips with permanently bonded specks of tungsten carbide for grabbing hold of the screw heads. For the past year, I've put both slotted- and Phillips-head Grrip screwdrivers to work in my shop. In that time, the tiny carbide grits have dulled slightly, but the screwdrivers continue to grip fasteners better than other products. Although Grrip drivers shine because of their innovative tips, their rugged shanks, and large, comfortably shaped handles also get top grades.

—Tested by Bill Krier



Grrip line of screwdrivers and power bits, available in slotted- and Phillips-head varieties in an array of sizes. Cost: about 50 percent more than other high-quality screwdrivers. For a dealer near you call the RemGrit Corporation at 203/336-2525.

Continued on page 88

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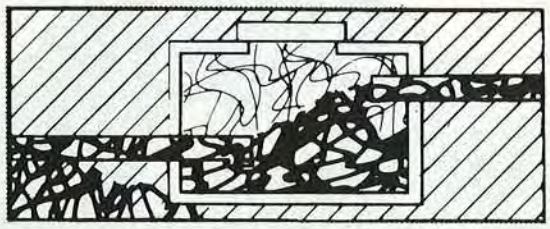
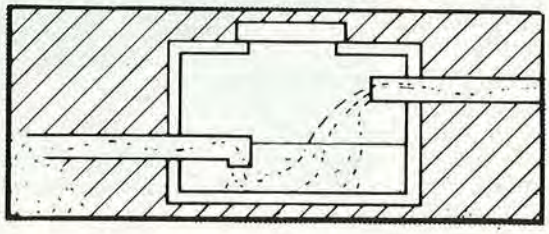


Septic Tank/Cesspool After



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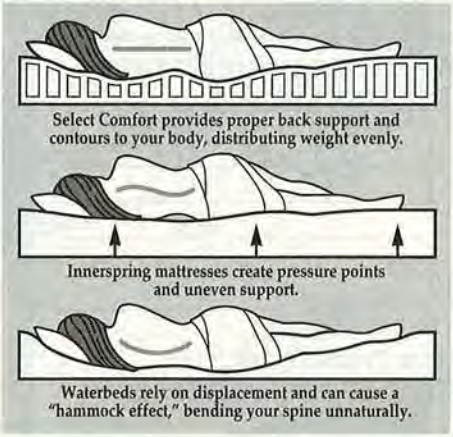

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PRODUCTS THAT PERFORM

Continued from page 86

Coping saw has features that put you in control

SHOP TESTED

In my opinion, the new line of precision fret and coping saws from Garrett Wade make other coping saws obsolete. Here's why.

I used one of these saws to help me install some interior moldings. Immediately, I appreciated their heavy-duty, cast-aluminum frames. This construction gives them extra rigidity which helps with tensioning the blade. That, in turn, lets me make faster, more accurate cuts.

Second, these saws have blade-tensioning knurled nuts on the end of the frame opposite the handle. This allows the manufacturer to firmly mount the handle to the frame. So, unlike other coping saws that you tension by turning the handle, the handles on these saws do not loosen and twist during use.

You can buy models with either a 10"-deep frame (shown in the photo *above*), or with a 4½"-deep frame. These saws cost two to three times as much as other coping saws, but, for the frequent user, the advantages make the extra cost well worth it.

—Tested by Bob McFarlin

Precision coping saws, 10" model 14I01.01, $34.90 ppd.; 4½" model 14I03.01, $30.45 ppd. Various replacement blades available in packs of 12 for $8.15. To order call 800/221-2942.

Two abrasives for budget-minded woodworkers

If you're looking for good-quality abrasives that won't set your pocketbook back too far, I'd like to tell you about two products from Industrial Abrasives that I recently tried. Here's what I discovered when I tested a 3×24" belt, and a roll of 4½"-wide, sticky-back abrasive.

After putting the so-called White Belt through a workout in my portable belt sander, it lasted slightly longer than other aluminum-oxide belts on bare wood. And, it seemed to do much better than average when I sanded away an old finish. That's because of the white, zinc-stearate coating; it reduces clogging and keeps down heat buildup.

Unlike some of today's non-directional belts with extra-long splices, I did detect a slight amount of thumping as the splices on the White Belts passed over the work surface. But, for the reasonable price and good performance, I can live with this small bother.

Industrial Abrasives' new E-Weight Sticky Rolls also impressed me. The product has a durable, green, aluminum-oxide abrasive bonded to a sturdy cloth backing. This pressure-sensitive-adhesive (PSA) backing saves you lots of time if your finishing sander has a PSA-compatible pad. You also can adhere the abrasive to sticks of various shapes for special hand-sanding tasks. In my tests, the abrasive held up well, and the adhesive backing never let go during operation.

—Tested by Chuck Hedlund

White Belt, available in three sizes: 3×21" ($24.95 for 24 belts); 3×24" ($25.95); and 4×24" ($29.95). E-Weight Sticky Rolls, $14.95 for 4½"×25' rolls. Both products distributed by Industrial Abrasives, 642 N. 8th St., P.O. Box 14955, Reading, PA 19612. Call 215/378-1861.

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WOOD ANECDOTE

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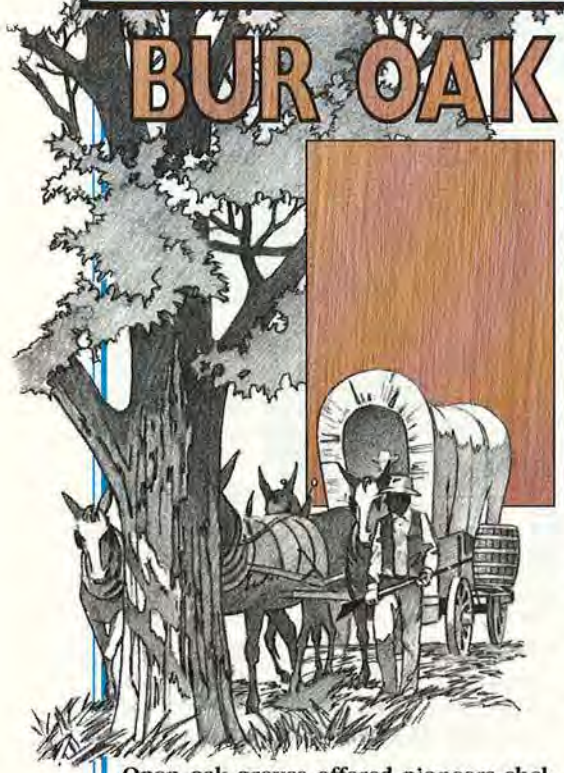

Open oak groves offered pioneers shelter on the grassy plains of the Midwest.

A TREE NO LARGER THAN ITS ROOTS

Were it not for the bur oak, pioneers in the Midwest would have been greeted by nothing but waving prairie grass. Instead, they also were welcomed by invitingly open groves of wide-spaced trees. Beneath the trees' drooping boughs grew a soft green carpet. What a relief from the East's tangled forests! Yet, little did the pioneers know of the great battleground they had entered.

Botanists now understand that the bur oak—called that because of the fuzzy cap on its acorn—was in constant combat with the tall prairie grass. In periods of dryness, the grass advanced. When it was wet, the forest gained, led by the bur oak.

Prairie fires, too, kept the oaks at bay. Then, with settlement, came cattle to pack down the soil so acorns had trouble sprouting. Livestock also ate the young seedlings' leaves. Yet, the bur oak survived due to its remarkable roots.

If you were to somehow peer beneath the ground under a bur oak, you'd discover a vast system. A relatively short taproot soon turns to a spreading maze of thick, horizontal roots. Each of the horizontals sends capillary roots down and up until the size of the entire growth below ground equals that of the tree above! Such a root system rises to penetrate even the deep-rooted prairie grasses to catch the slightest rainfall and remain in competition. In fact, the bur oak's prime competitor is another bur oak. That's why they always grow some distance apart—the diameter of each tree's roots determining their closeness.

Illustration: Jim Stevenson

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23-880	8" Bench Grinder 1/2 HP	151	115
11-950	8" Drill Press	199	144
31-050	1" Belt sander 2.0 amp	104	78
31-460	4" Belt/Disc Sander	198	135
31-340	1" Belt/8" Disc Sander	268	188
31-080	1" Belt/5" Disc Sander	134	94
40-560	16" 2 speed Scroll Saw	266	179
11-990	12" Bench Drill Press	276	224
11-090	32" Radial Bench Drill Press	399	285
43-355	3/4" Shaper 1-1/2 HP	964	695
43-505	1/2" Bench Router/Shaper	399	275
22-540	12" Bench Top Planer	595	389
36-220	10" Compound Mitre Saw	350	239
28-180	Bench Band Saw	232	167
40-640	20" Bench Scroll Saw	466	318
23-675	NEW 6" Grndr/3x24Belt Sndr	141	105
14-600	Hollow Chisel Mortiser	668	438
46-700	12" Wood Lathe	548	419
34-761	10" Unisaw 1-1/2 HP	1715	1275
	Unisaw has $100 rebate-price is before rebate		
33-990	10" Radial Arm Saw	818	589
37-280	6" Motorized Jointer	488	395
50-179	3/4 HP 2 stage Dust Collector	483	335
70-200	20" Floor Drill Press	1049	815
33-055	8-1/4" Sawbuck comp w/legs	865	579
34-330	8-1/4" Table Saw 13A	343	228
32-100	Station Plate Jointer	645	265
36-040	8-1/4" Compound Mitre Saw	224	165
34-915	30" Unifence	385	239
34-897	50" Delta Unifence	525	285
36-755	10" Tilt Arbor Saw	1264	895
34-444	Contractors Table Saw	850	615
17-900	16-1/2" Floor Drill Press	495	395
40-601	18" Scroll Saw with stand	942	729
22-662	13" Planer complete - 2HP	1499	1159
33-060	NEW "Sidekick" Miter Saw	499	368
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50-075	Dust Collector/Sweeper 3/4 HP	360	245

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34-445	34-444 Saw w/30" Unifence	1200	759
37-154	DJ15 6"Jointer w/3/4HPmotor	1420	1079

MILWAUKEE TOOLS

6527	NEW Sawzall with case	299	164
6528	above Sawzall w/wired cord	295	164
6125	NEW 5"Random Orbit Sander	200	119
6126	NEW 6"Random Orbit Sander	205	125
0399-1	12V cordless Drill Kit comp	304	164
0402-1	above Drill w/keyless chuck	309	168
0395-1	9.6V cordless Drill with case	284	155
0224-1	3/8" Drill 4.5 amp magnum	203	114
0234-1	1/2" Drill 4.5A mag 0-850 rpm	223	119
0244-1	1/2" Drill 4.5A mag 0-600 rpm	223	119
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	189	107
0228-1	3/8" Drill 3.5 amp 0-1000 rpm	183	100
0375-1	3/8" close quarter Drill	223	127
0379-1	1/2" close quarter Drill	254	145
6539-1	cdls Screwdriver 190 rpm	127	75
6546-1	cdls Scrwdvr 200 & 400 rpm	138	82
5399	1/2" D-hdle Hammer Drill Kit	319	184
6750-1	Drywall Gun 0-4000 5 amp	162	93
6507	Original SawZall with case	249	135
6014	Orbital Sander 1/2 sheet	214	118
8977	variable temp. Heat Gun	122	74
5397-1	3.8" var. spd Hammer Drill Kit	244	138
5371-1	1/2" var. spd Hammer Drill Kit	335	185
3107-1	1/2" v/spd right angle Drill Kit	370	198
6754-1	Drywall Gun 0-4000 5.4 amp	192	108
3300-1	1/2" var. spd right angle Drill	329	184
5680	Router 2 HP - 12 amp	355	198
0235-1	1/2" Drill w/keyless chuck	223	125
6145	4-1/2" Grinder 10,000 rpm	162	98
6142	6145 with case & accessories	199	129
6749-1	Drywall Gun 0-2500 5.4 amp	224	122
6365	7-1/4" Circular Saw 13 amp	214	120
6366	6365 w/fence & carbide blade	224	125
6368	6365 w/fnce,carb. blde,& cse	244	138
6369	New 7-1/4 Circ saw w/brake	245	149
6377	7-1/4" Worm Drive Saw	324	178
6256	Top Handle Jig Saw	220	142
6490	10" Mitre Saw	444	269

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5/8" Bore - Industrial Grade

Item	Description	Teeth	List	Sale
LU72M010	Gen Pur. A.T.B.	10" 40	67	39
LU82M010	Cut-off	10" 60	90	49
LU84M011	Comb	10" 50	76	40
LU85M010	Super Cut-off	10" 80	112	58
LM72M010	Ripping	10" 24	66	37
LU73M010	Cut off	10" 60	82	44
LU87M010	Thin Kerf	10" 24	70	38
LU88M010	Thin Kerf	10" 60	86	43
LU98M010	Ultimate	10" 80	125	65

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TK206	10" Framing	24	38	25
TK303	7-1/4" Finishing	40	37	22
TK306	10" Finishing	40	46	25
TK906	10" Combo	50	52	29
SD306	6" Dado - Carbide		215	109
SD308	8" Dado - Carbide		229	119
F0	1-3/4" x 5/8" Biscuit 1000 Qty		32	29
F10	2-1/8" x 3/4" Biscuit 1000 Qty		32	29
F20	2-3/4" x 1" Biscuit 1000 Qty		34	29
FA	Assorted Biscuits 1000 Qty		34	29
FB100	16 piece Forstner Bit Set		331	174
94-100	5 pc. Router Bit Door System		319	158
FT2000E	3-1/4 HP v/spd Plunge Router		410	199
JS100	Biscuit Jointer with case & FREE G100 Glue System		334	162

MAKITA TOOLS

Model		List	Sale
6070DW	3/8" v/spd Reverse Drill 7.2V	124	74
6071DWK	above Drill w/removable batt.	194	108
5090DW	3-3/8" Saw Kit 9.6 volt	250	138
6010SDW	3/8" cordless Drill Kit 7.2V	96	59
ML900	Incandescent Flashlight 9.6V	Sale	37
6093DW	v/spd Drill w/clutch-complete	261	135
6093DWE	6093DW Drill Kit w/2 batteries	270	139
6095DWE	6095DW Drill Kit w/2 batteries	270	139
6011DW	NEW 12V Drill Kit complete	320	168
632007-4	9.6 volt Battery	47	30
632002-4	7.2 volt Battery	39	28
5007NBA	7-1/4" Saw w/electric brake	243	125
5008NBA	8-1/4" Saw w/electric brake	301	163
B04510	1/4 sheet Pad Sander	93	54
9900B	3" x 21" Belt Sander w/bag	283	145
9924DB	3" x 24" Belt Sander w/bag	299	159
4301BV	Orb. var. spd Jig Saw 3.5A	262	142
JR3000V	var. speed Recip Saw w/case	239	125
LS1020	10" Mitre Saw 3.5 amp	571	299
9820-2	Blade Sharpener	394	194
1900BW	3-3/4" Planer with case	221	116
1911B	4-3/8" Planer 7.5 amp	255	138
9207SPC	7" Sander/Polisher	294	154
9514B	4" Disc Grinder 4.6 amp	100	65
3601B	1-3/8 HP Router	261	139
B04550	1/4 sheet Pad Sander w/bag	91	54
DA3000R	3/8" Angle Drill	285	149
2708W	8-1/4" Table Saw	519	259
2711	10" Table Saw with brake	868	485
6404	3/8" Drill Rev. 0-2100 rpm 2 A	105	57
6510LVR	3/8" Drill Rev. 0-1050 rpm	152	79
6820V	0-4000 rpm Drywall Gun 5.2 A	160	89
6013BR	1/2" Drill Rev. 6 amp	263	138
5402A	16" Circular Saw 12 amp	675	345
3612BR	3 HP Plunge Router	347	169
9401	4" x 24" Belt Sander w/bag	343	174
4302C	var. speed Orbital Jig Saw	283	152
5077B	7-1/4" Hypoid Saw	260	138
LS1030	NEW 10" Mitre Saw	428	195
5007NB	7-1/4" Circular Saw 13 amp	214	114
2012	12" Portable Planer	913	465
LS1011	10" Slide Compound Saw	859	438

SIOUX TOOLS

8030	New 3/8" var/spd Drill	238	148
8000	3/8" var/spd close qtr Drill	201	128
690	5" Air Random Orbit Sander	139	138
690VV	690 w/ventun dust collection	261	178
658	5" Air Rndm Sander-dual action	261	158

SENCO AIR NAILERS

SFN1	Finishing Nailer 1" - 2"	377	255
SFN2	Finish. Nailer 1-1/2" - 2-1/2"	571	375
SN325	Nailer 1-7/8" - 3-1/4"	665	395
SN4	General purpose 2" - 3-1/2"	685	468
SLP20	New Pinner w/cse 5/8" - 1-5/8"	399	269
SKS	Stapler 5/8" - 1-1/2"	351	239

BOSTITCH AIR NAILERS

N80S-1	Stick Nailer	Super Sale	355
N12B-1	Coil Roofing Nailer	845	445
N60FN-2	Finishing Nailer	625	329
T31	Brad Nailer	270	149
CWC100	1 HP Pancake Compressor	445	289

EXCALIBUR Fences & Tables

TT45R24L9	24" Fence	369	299
TT45R50L12	50" Fence	399	329
EXSLT30	Sliding Table	599	475
EXSLT60	Sliding Table	745	585

SKIL SIZZLERS

77	7-1/4" Worm Drive Saw	230	138
2735-04	12 volt cordless Drill Kit	210	132
2735-04X	2735-04 with keyless chuck	235	132
1605-02	NEW Biscuit Jointer w/case	200	125
3400	10" Table Saw - Bench Top	250	179
3330	16" Scroll Saw - Bench Top	200	135
3380	8" Drill Press - Bench Top	200	135

PANASONIC CORDLESS

EY6205BC	NEW variable speed 12 volt Drill w/15 minute charger & case	390	179
EY6281BC	NEW variable speed 9.6 voll Drill w/15 minute charger & case	350	168
EY571B	var. speed 9.6 volt Drill Kit	239	134
EY571BC	EY571B with case & 2 batt	275	145
EY6207BC	NEW 12 volt 1/2" Drill w/keyless chuck var. speed w/15 minute charger & case	421	218
EY6205EQK	Same as EY6205BC but battery has 40% more life & 20% more torque	368	189

PASLODE IMPULSE GUNS

IM250	Trimpulse Finish Nailer Kit	849	615
IM325	Impulse Framing Nailer Kit	849	615
402500	Extra Battery	Sale	42.95

HITACHI TOOLS

C7SB	7-1/4" Circular Saw	214	109
C7BD	7-1/4" Circular Saw with brake	230	118
M12V	NEW 3 HP var. speed Router	447	225
TR12	Plunge Router 3 HP	354	167
F1000A	12" Planer/6" Jointer	2835	1549
C10FA	10" Deluxe Mitre Saw	538	268
C12FA	NEW 12" Mitre Saw	632	298
C8FB	8-1/2" Slide Compound Saw	899	445
FREUD LU91M008	8-1/2" Carb bld 48 t	68	43
C15FB	15" Mitre Saw	745	368
FREUD LU85M015	15"c/bld 108 tooth	180	99

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DW944K	3/8" 9.6 volt cordless drill kit with 2 batteries		264	149
DW610	1-1/2 HP 2 handle Router		250	138
DW411	1/4 sheet Palm Sander, 1.7 amp		87	54
DW100	3/8" Drill, 4 amp,0-2500 rpm,rev		110	65

PORTA NAILER

401	Porta Nailer complete	265	198
501	Face Nailer complete	265	195

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6204	4' Fiberglass	179	65
6205	5' Fiberglass	199	75
6206	6' Fiberglass	215	80

WINTER KIT SPECIALS

9852K	Porter Cable 9852 Drill Kit w/extra batt	185	
9853K	Porter Cable 9853 Drill Kit w/extra batt	175	
7335K	Porter Cable 5" var. spd Random Orbit Sndr w/cse & 1 roll 100X & 150X discs	273	159
7336K	Porter Cable 6" var. spd Random Orbit Sndr w/cse & 1 roll 100X & 150X discs	278	165
555K	Porter Cable Plate Biscuit Jointer with case & 1000 assorted biscuits	339	195
JS100K	Freud Jointer w/cs & 1000 biscuits	351	188
1581VS	Bosch Top Handle Jig Saw with case & 30 Bosch blades	305	182
1582VS	Bosch CLIC Barrell Grip Jig Saw with case & 30 Bosch blades	305	182
JM100K	Ryobi Joiner w/1000 biscuits	475	232

BIESMEYER FENCES

B-50	50" Commer. Saw Fence	329	294
T-SQUARE 52	52" Homeshop Fence	249	234
T-SQUARE 40	40" Homeshop Fence	242	208
T-SQUARE 2828	28x28" Homeshop Fence	230	198

WEDGE SMART LEVEL

SM-PR2	2 FT Level with sensor	120	88
SM-PR4	4 FT Level with sensor	150	105
SM-PR6	78" Level with sensor	180	139
SERIES200	NEW 2FT Level with sensor		55

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#2	12"	8-1/2"	24.95	14.95	80.95
#3	14"	10"	31.61	18.95	104.95
#4	16"	12"	42.30	24.95	143.95

JORGENSEN STYLE 37 2-1/2"Throat 1/4"x3/4"

Item#	Jaw Length	List	Sale	Box of 6
3706	6"	9.86	6.25	34.75
3712	12"	10.92	6.75	37.75
3718	18"	12.05	7.25	40.75
3724	24"	13.16	8.19	43.75
3730	30"	14.70	9.10	49.75
3736	36"	16.05	10.19	55.75

PONY CLAMP FIXTURES

Model		List	Sale	Lots of 12
50	3/4" Black Pipe Clamps	13.61	7.89	84.99
52	1/2" Black Pipe Clamps	11.37	6.50	69.50

BOSCH

1581VS	Top Handle Jig Saw	265	135
1582VSC	NEW CLIC Barrell Jig Saw	265	135
	Bosch Metal Case for above Jig Saws	34	32
	Bosch 30 blade assortment for Jig Saws		26.99
1942	Heat Gun 600° - 900°	111	69
1272D	3" x 24" Belt Sander with bag	329	178
1273D	4" x 24" Belt Sander with bag	345	189
11-212VSR	Bulldog 3/4"SDS Rtry Drill	370	198
1347AK	4-1/2" Grinder w/case & access.	170	108
1348AE	5" Grinder 8.5 amp	195	118
1194VSR	1/2" var. speed Hammer Drill	264	145
1194VSRK	above Hammer Drill w/case	292	179
1608	5.6 amp Laminate Trimmer	149	84
1609K	Lam Installers Kit with 1609	309	175
1609KX	Deluxe Installers kit	361	198
1601	1 HP Router	184	105
1602	1-1/2 HP Router	215	135
1603	1/2 HP D-handle Router	252	145
1604	1-3/4 HP 2 Handle Router	236	134
1604K	same as above w/cse & acc	287	165
1606	1-3/4 HP D-handle Router	273	158
3258	3-1/4" Planer w/blade guard	239	139
3258K	3258 Planer with steel case	265	154
3270D	3" x 21" Belt Sander with bag	260	145
1273DVS	var. spd 4" x 24" Belt Sander	370	193
1614	NEW 1HP Plunge Router	220	128
1614EVS	NEW 1-1/4HP v/spd Plge Rtr	255	149
1613	NEW 1-3/4 HP Plunge Router	286	164
1613EVS	NEW 2HP v/sp Plunge Router	320	184
1615	NEW 3 HP, Plunge Router	395	228
1615EVS	NEW 3 HP v/spd Plge Router	460	244
1632VSR	K Recip Saw 8.4A orb-v/spd	225	145
3050VSR	K 9.6V cdls v/sp Drill Kit comp	256	138
3051VSR	K 3050VSR K w/keyless chuck	266	145
1370DEVS	6" Random Orbit Sander	481	219
3283DVS	5" Random Orbit Sander	159	98
3283DVSK	3283DVS Kit complete	220	119

ELU BY BLACK & DECKER

Model		List	Sale
3338	2-1/4 HP v/spd Plunge Router	427	255
3304	1 HP var. spd Plunge Router	292	164
3375	3-1/8" Univ. planer 7.2 amp	313	155
3380	Biscuit jointer with case	542	248
4024	3 x 21 var. speed Belt Sander	322	184

BLACK & DECKER

1166	3/8" Drill 0-2500 rpm 4 amp	100	65
1703	10" Mitre Saw w/73-770 blde	313	179
4011	1/4 sheet Palm Sander	82	59
79-034	Workmate 400	175	105
2694	7-1/4" Super Saw cat	248	137
2695	8-1/4" Super Saw cat	271	153

DAVID WHITE

LP6-20	Sight Level package - 20x	310	198
L6-20	Meridian Level - 20x	290	189
LT8-300	Level Transit - 26x	650	445
LT8-300P	above Level w/optical plum	769	525
LT6-900	Level Transit - 20x	389	245
ALT6-900	Automatic Level - Transit - 18x	549	385
ALTP5-900	above Level w/tripod & rod	600	438
ALP6-18HD	above Level w/tripod and rod	550	372

RYOBI SPECIALS

JP-155	6-1/8" Jointer/Planer	611	295
TS-254	NEW 10" Mitre Saw	397	195
TS-254K	above Saw with acc. kit & B&D 73-770 carbide blade	495	245
AP10	10" Surface Planer 13 amp	820	355
RE600	3 HP Plunge Router	431	209
BE321	3" x 21" var. spd Belt Sander	272	135
SC160	NEW 16" Bench Scroll Saw	261	144
TFD220VRK	12V cordless Drill Kit	325	165
JM100K	NEW Biscuit Jointer w/case	431	204
RS115	NEW 4-1/2"v/sp Rdm Orb Sndr	134	74
BT3000	NEW 10" Table Saw	699	545
TSS220	NEW 8-1/2" Slide Comp. Saw	790	445
DS1000	NEW Detail Sander	80	55
RS112	NEW Palm grip Random Orb Sndr	80	59
AP12	NEW 12" Bench Planer	840	425

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QUAL-CRAFT PRODUCTS

2200	Pump Jack	79	58
2201	Pump Jack Brace	30	20
2203	Pump Jack guard rail holder	31	21
2204	Workbench & rail holder combo	53	39
	Buy any 6 (can be assorted) deduct additional 10%		
2601	Wall Jack	167	114
	Lots of 4 deduct additional 10%		

PORTER CABLE

690	1-1/2 HP Router 8 amp	240	134
9690	690 Router with steel case	305	149
691	1-1/2 HP Router D-handle	260	140
695	1-1/2 HP Router/Shaper	335	204
696	HD Shaper Table	185	123
351	3" x 21" Belt Sander w/o bag	245	140
352	3" x 21" Belt Sander with bag	255	144
360	3" x 24" Belt Sander with bag	330	179
361	3" x 24" Belt Sander w/o bag	310	169
362	4" x 24" Belt Sander with bag	345	188
363	4" x 24" Belt Sander w/o bag	330	183
315-1	7-1/4" Top Hdle Circular Saw	210	118
9315-1	315-1 comp. w/cs & carb bld	240	135
617	7-1/4" Pushhandle Saw	210	119
9617	617 comp. w/cse & carb blde	240	135
314	4-1/2" Trim Saw	240	135
97751	1/2" v/spd Hammer Drill w/cse	260	155
9629	Recip Saw var. speed 8 amp	250	144
9118	Porta Plane Kit 7 amp	360	198
505	1/2 sheet Pad Sander	210	116
6511	3/8" var. speed Drill 5.2 amp	200	115
6614	1/2" var. speed Drill 0-750 rpm	210	120
6615	7514 with keyless chuck	215	124
7549	Top handle Jig Saw 4.8 amp	250	145
330	Speed Block Sander 1/4 sheet	103	58
555	Plate Biscuit Jointer with case	315	168
345	6" Saw Boss 9 amp	180	102
9345	345 comp. w/cse & carb blde	210	119
9647	TIGER CUB Recip. Saw	195	115
9637	Full var/spd Recip Saw 8 amp	250	138
7519	3-1/4 HP Router 2 Handle	410	224
7518	3-1/4 HP 5 speed Router	475	259
7538	3-1/4 HP Plunge Router	410	224
7399	5.6 amp Drywall Cutout Unit	140	82
7310	5.6 amp Laminate Trimmer	150	88
97310	Laminate Trimmer Kit comp	345	192
7334	5" Random Orbit Sander	210	119
7335	5" var. spd Rndm Orbit Sndr	230	129
7336	6" var. spd Rndm Orbit Sndr	235	134
73333	NEW Dust Collection system		24.50
693	1-1/2 HP Plunge Router Base	295	165
6931	Plunge Router Base	120	75
7539	3-1/4HP var/spd Plunge Router	475	259
9852	12V 3/8"Drill w/cse 0-1000rpm	270	149
9853	9852 with keyless chuck	270	149
9854	12V 1/2" Drill w/cse 0-360 rpm	280	155
8500	12V battery for above drills	Sale	39
	New Tools by Porter Cable		
332	Palm Grip Rndm Orbit Sander	109	64
333	above Sander with dust bag	125	74
352VS	3x21 Belt Sander w/bag v/spd	280	159
7116	24" Omni Jig	470	288
334	333 Sander with PSA pad	125	74
550	Pocket cutter with case	330	185
7700	10" "Lazerloc" Miter Saw	634	345

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AND THE TOP WINNERS ARE...

Each June for the last 26 years, carvers from across the country assemble at the International Woodcarvers Congress (IWC) held at the Putnam Museum in Davenport, Iowa. There, they learn techniques from foremost pro carvers as well as view the hundreds of carvings entered in dozens of categories.

Last year, Rick Harney of Normal, Illinois, won the Best of Show award with the relief carving shown *above right*. Winner of the *WOOD®* magazine-sponsored People's Choice Award was the butternut carving "In his hands," *far right*, by Mayetta, Kansas, carver Gerald Copeland, who used his grandfather as the subject.

The 1993 edition of the IWC opens to the public on June 24 and runs through June 27. Carving seminars will be held June 21–25. Carving entries—carried in—will be accepted June 19 and 20 (those days mark the deadline for shipped entries). For more information, write: *IWC, P.O. Box 10408, Bettendorf, IA 52722. (Or call Show Chairman Larry Yudis at 319/359-9684.)*

▲ **Rick Harney's relief carving "Homage to Raphael Soyer" took Best of Show in Davenport, Iowa last June.**

▶ **Winner of the International Woodcarvers Congress' Peoples Choice Award was Gerald Copeland's 29"-tall carving.**

Print this article

Acid rain: It can make trees grow

So far in the United States, especially New England, acid rain has had a negative impact on forests. In Sweden, though, acid rain may be having a positive influence. The Western Wood Products Association reports that Swedish researchers responsible for forecasting forest growth/harvest balances suddenly found trees growing more rapidly. They say this stems from nitrogen found in the acid rain that comes from the Continent and Eastern Europe. It fertilizes their forests.

Misplaced old growth finally surfaces

At the turn of the century, the forests that border Lake Superior were the scene of immense logging operations. The harvest of virgin white pine and hemlock logs—as well as hardwood ones of maple, birch, and occasionally cherry, walnut, and elm—were rafted on the lake for towing to mills in Duluth, Superior, Ashland, and elsewhere. Over a two-decade span, tens of thousands sunk during the voyages.

The logs lay preserved in Lake Superior's depths—where low oxygen and cold temperatures kept decay at bay—until they were discovered by divers. Now, the old logs may be resurrected for a new life as woodworking stock.

Scott Mitchen's Explorations International, of Washburn, Wisconsin, is reclaiming the long-lost logs from the lake by means of divers, floats, and barges. Dried out, the wood from these logs looks as if it has been freshly felled. And because the trees were old-growth at harvest, the 3–4' diameter logs offer fine grain with few knots. According to Scott, the company someday plans to mill all of the resurrected wood at a projected replica of an 1870s' sawmill so local craftsmen can turn it into furniture representative of the old logging days. For more information: *Explorations Intl., 715/373-2532.*

OH NO, PLASTIC TREES

According to *Europe Magazine*, the arid North African country of Libya plans to plant 40,000 specially constructed, full-sized plastic trees to attempt a climate change. Developed by Spanish inventor Antonio Ibanez, the palm-like trees have polyurethane roots and plastic-and-foam trunks filled with holes, as well as branches and leaves.

Here's the plan: Following the principle that cooler ground temperatures generate rain, the trees' upper portions will absorb moisture during cold desert nights, and then slowly release it during the day. If the plastic-tree plan works, and the cycle begins, Libya will undertake the expense of a massive planting of real trees to continue the program.

Illustrations: Jim Stevenson Photographs: Bob Mischka

The American Toolmaker

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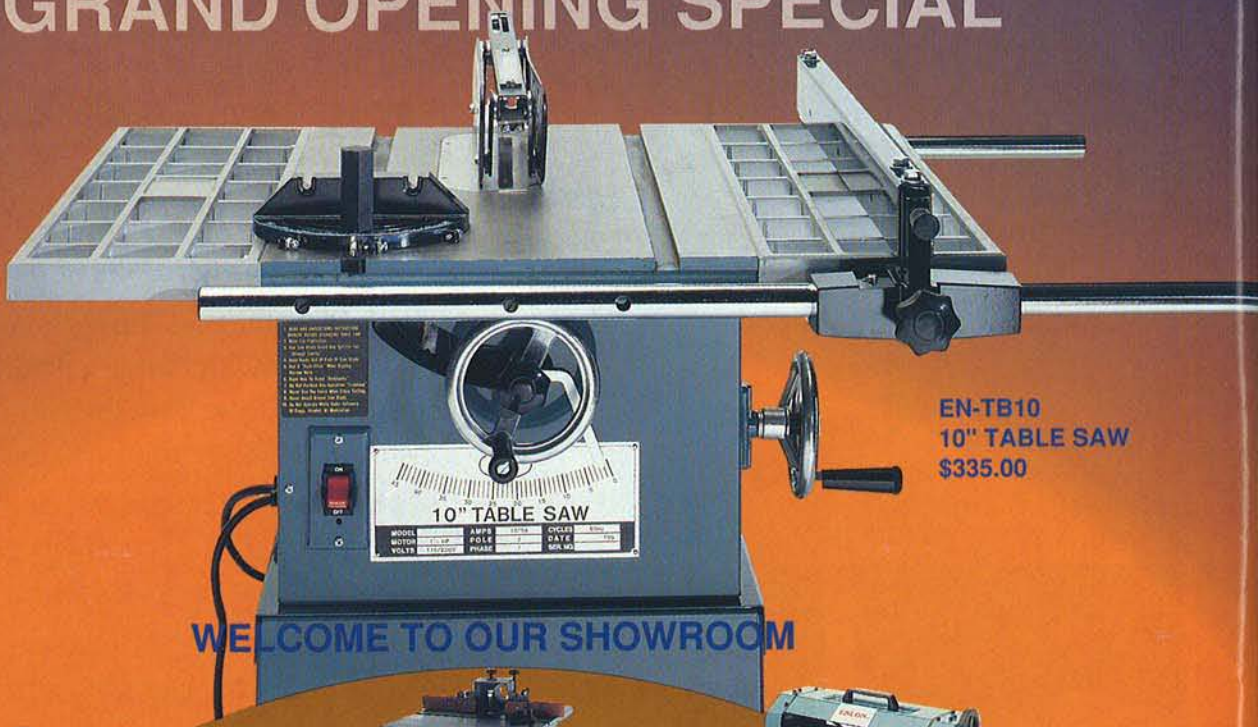

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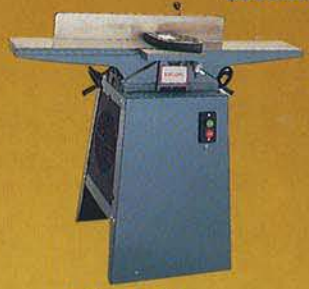

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